

Export Version Of F-16 Fighter Being Planned

Earlier this month, President Carter decided that in certain cases, the sale to foreign countries of intermediate fighter aircraft developed or modified for export would be in the national interest and would be consistent with the objectives of U.S. arms transfer policy.

In announcing his decision, the President defined an intermediate fighter as "one whose cost and performance characteristics would generally lie between our current export fighter, the F-5E, and fighter aircraft now in production for U.S. forces, such as the F-16."

Fort Worth Division has been working for some time on an F-16 powered by a General Electric J79 jet engine which would be sold to those countries seeking an advanced fighter, but not requiring the very high performance of the first-line F-16As currently being delivered to the U.S. Air Force and our allies.

Designated the F-16/J79, the aircraft would be powered by a 17,900-pound-thrust J79 turbojet engine. The standard F-16 is powered by the 25,000-pound-thrust-class Pratt & Whitney F100 afterburning turbofan engine.

In his decision, President Carter said the availability of an export fighter, or F-X as it is called, will contribute to our national security objectives by permitting the U.S. to respond positively to the security needs of our friends and allies and at the same time discourage purchases of more sophisticated first-line aircraft from the United States and other suppliers.

The F-16/J79 would be very capable of performing in a defensive role and would also be able to carry out ground support missions. It would weigh somewhat more than the standard F-16 and would have a shorter combat range.

Development and production of the F-16/J79 could be accomplished concurrently with present F-16 production.

General Dynamics Plans Purchase of Cement Operation

General Dynamics and National Gypsum Co. have entered into an agreement in principle for the sale of National Gypsum's cement division to General Dynamics. The transaction will be based on book values, which were approximately \$100 million at year-end 1979.

National Gypsum's cement division includes mills at Alpena, Mich., with a capacity to produce 2.5 million tons of various types of Portland and masonry cement annually, and at Evansville, Pa., with an annual capacity to produce 935,000 tons of cement. The division also has related storage and distribution facilities. It would operate as an integral unit within the General Dynamics resources group.

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Oliver Boileau Is Appointed President of Corporation

The General Dynamics Board of Directors on January 10 appointed Oliver C. Boileau as President of the corporation and also elected him a Director. As President, Boileau will succeed David S. Lewis, who will continue to serve as Chairman and Chief Executive Officer.

Boileau was a Vice President of The Boeing Company and served as President of Boeing Aerospace Company.

"We are very fortunate to have Ollie Boileau join General Dynamics," said Lewis in announcing the action of the Board. "With his extensive technical and managerial background, Mr. Boileau will add substantial strength to the General Dynamics management team and greatly enhance our ability to capitalize on the many business opportunities that lie ahead for this company."

Boileau joined Boeing in 1953 after receiving his Bachelor of Science and Master of Science degrees in Electrical Engineering from the University of Pennsylvania. He later was a Sloan Fellow at the Massachusetts Institute of Technology where he received a Master of Science degree in Industrial Management in 1964.

Boileau (pronounced Boy'-low), 52, began his career at Boeing as an electrical engineer and progressed through many technical and management positions of increasing responsibility. He was Manager of the Minuteman ballistic missile program and Vice President - General Manager of the Boeing Missile Division. He was appointed Vice President of The Boeing Company in 1968.

Boileau is a senior consultant to the Defense Science Board, a member of the National Academy of Engineering, and a fellow of the American Institute of Aeronautics and Astronautics.

Boileau and his wife, Nan Eleze, are both natives of New Jersey, and are the parents of four children, Clark Edward, Adrienne Lee, Nanette Erika and Jay Marshall.



Oliver C. Boileau

NASA Awards Convair Contract To Support Atlas/Centaur Program

Convair Division has received a \$12.4 million contract from the National Aeronautics and Space Administration's (NASA) Lewis Research Center, Cleveland, for management and engineering services to support the Atlas/Centaur launch vehicles program.

The contract is a continuation of work performed under earlier contracts for similar services. The most recent award calls for Atlas/Centaur support for Earth orbital missions through 1980.

NASA has relied on the Atlas/Centaur launch combination over the years to lift scientific and communications payloads into space. Centaur is the nation's first high-energy, liquid hydrogen-liquid oxygen rocket vehicle and is used as a second stage with the Atlas booster.

In 1979, the company's space launch vehicles achieved 100 percent success for the second consecutive year. The Atlas launch vehicle, combined with the Centaur high-energy upper stage, sent a Fleet Satellite Communications (FltSatCom) pay-

load into orbit and also boosted NASA's High Energy Astronomy Observatory aloft. The FltSatCom was the 50th launch for Atlas/Centaur.

Additionally, an Atlas F sent a weather satellite aloft for the National Oceanic and Atmospheric Administration from the Western Test Range at Vandenberg AFB, Calif.

In 1980, Atlas/Centaurs are committed to launch another FltSatCom spacecraft and four Intelsat V communication satellites. The FltSatCom is scheduled for launch in January. Intelsat Vs are currently targeted to be boosted in February, May, August and December.

The management and engineering support activities recently contracted by NASA will be carried out at Convair's Kearny Mesa plant and at the Eastern Space and Missile Center in Florida.

NASA's Lewis Research Center provides management of the Atlas/Centaur launch vehicle through all phases of manufacturing, testing and launch.

Quincy Shipyard Awarded Contracts To Build 3 Barges

A \$42 million contract awarded early this month to Quincy Shipbuilding Division for the construction of three oil-carrying barges brings to over \$100 million the amount of new business the shipyard has received in the last five months.

Two of the barges in the contract, let by Coastwise Trading Company, Inc. of Delaware, will have a capacity of 175,000 barrels of oil. They will be 471 feet long and have an 84-foot beam and a depth of 42 feet. The third barge, which will have a capacity of 120,000 barrels, will be 415 feet long and have the same beam and depth.

The barges, which will be used in inter-coastal service, are scheduled for delivery at two-month intervals starting in December 1980.

The contract is the fourth piece of new business the shipyard has received since mid-September. The other three contracts include two overhaul jobs -- one for the 370-foot cable ship, *Neptune*, from the U.S. Navy, and another for the 123,000-ton oil tanker, *Seatiger*, from Cambridge Tankers, Inc., of New York. The third is for the construction of two large oil barges for Bulkfleet Marine Corp. of Texas.

The new contracts will provide jobs for several hundred Quincy shipbuilders for the next year or more.

The yard also has two liquefied natural gas tankers under construction that are scheduled for delivery later this year.

Tests Begin On New Tomahawk Box Launcher

A series of tests of the Navy's new armored box launcher (ABL) for the Convair Tomahawk cruise missile began last month at the Pacific Missile Test Center, at Pt. Mugu, Calif.

The tests involve tethered and flyaway firings of Tomahawk and Harpoon missiles and will last through February 1980.

After the first test on December 11, "There was virtually no damage to either the launcher or the simulated ship structure behind it," according to Bill Daly of Convair's Tomahawk ship-launch group.

The ABLs, each consisting of four tubes surrounded by armor plating, are planned to be mounted on the decks of Navy ships. Fully fueled and armed missiles would be loaded into the launchers' tubes and secured ready for firing.

In action, the ABL would be raised to an angle of 35 degrees and the missile boosted into flight using the same solid-fueled rocket motor presently used on the submarine-launched Tomahawk. After the boost motor takes the missile clear of the ship, it is jettisoned and the missile transitions to cruise flight, powered by its turbofan jet engine.

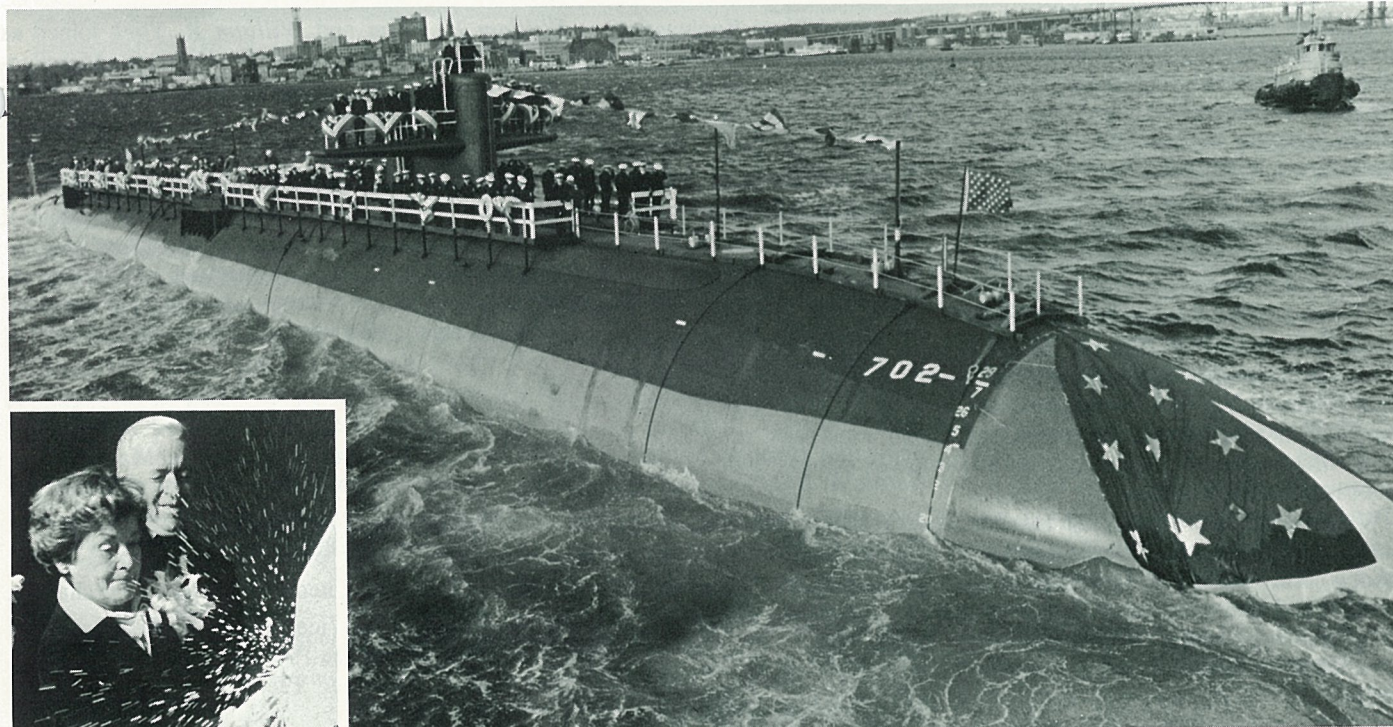
Convair Division built the ABL units, which were designed by the Navy. One unit is now at Pt. Mugu, and another has been installed on the deck of the USS *Merrill* (DD 976) in preparation for sea trials. During deployment of the *Merrill*, test missiles will remain in the launcher to check effect of an ocean environment on the ABL and missiles.

Program officials say that after the firings at Pt. Mugu are completed in February, that ABL will be returned to Convair for refurbishment and further ground tests.

Board Declares Stock Dividends

The General Dynamics Board of Directors declared the regular quarterly dividend of 30 cents per share on the company's common stock and \$1.0625 per share on its Series A preferred stock.

The dividend on the common stock will be payable on Feb. 19, 1980, and the dividend on the preferred will be payable on Feb. 15, 1980. The record date for both classes of stock is Jan. 21, 1980.



Phoenix Launch. The high-speed attack submarine Phoenix (SSN 702) floats in the Thames River at Groton Conn., moments after being christened by Elizabeth Harvey Rhodes (inset), wife of Representative John J. Rhodes, on December 8.

Fort Worth Sets Example For Factory Modernization

Fort Worth Division is cutting the cost of building F-16 Multirole Fighters by giving assembly workers better tools to do the job.

The division's increasingly efficient F-16 manufacturing program stands out as an exception in an era of declining productivity, according to U.S. Air Force Maj. Gen. James W. Stansberry, Deputy Chief of Staff for Procurement and Manufacturing.

The general challenged a gathering of Defense Department officials and aerospace industry leaders at Fort Worth to reduce defense system production costs by following the example of the Air Force/General Dynamics program that is converting the 38-year-old Fort Worth assembly plant into a modern factory.

The Air Force Materials Laboratory's Manufacturing Technology Division has worked closely with Fort Worth production management and with the Air Force Plant Representative Office in Fort Worth to identify opportunities for technological innovations and to rearrange the assembly line for more efficient production flow.

Several significant systems have already been installed at Fort Worth:

- Robot devices that automatically drill

and rout F-16 aluminum fuselage panels and composite tail skins.

- A no-contact photographic system that inspects assembly tools without removing them from service.

- Advanced data processing used to enhance work planning and scheduling and to provide process controls and work status reports.

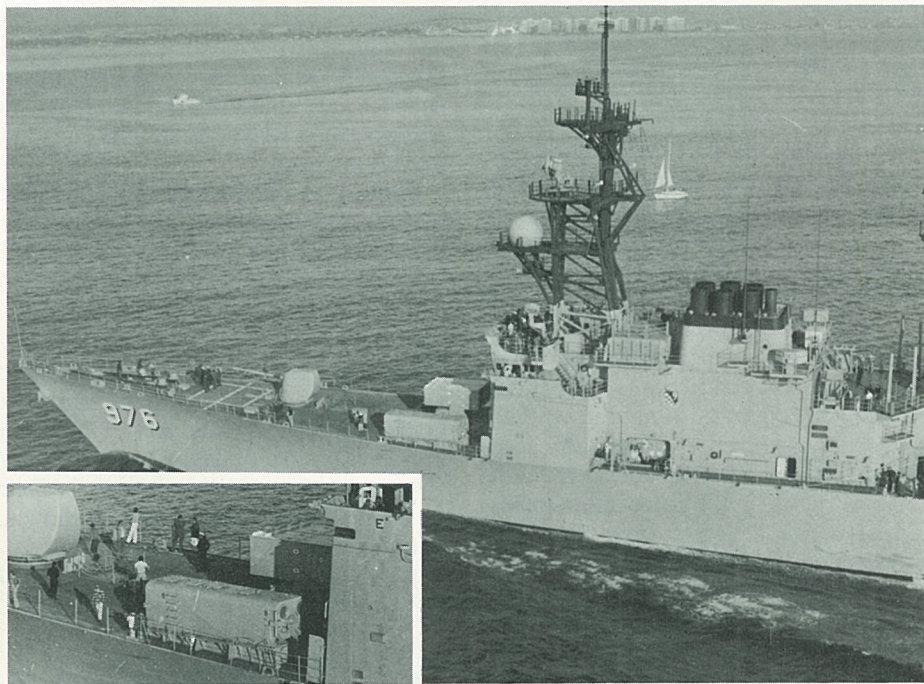
- A heavy machining center which produces fuselage bulkheads and wing spars using numerically controlled profiling mills fitted with automatic tool changers and computer drives.

The modernization program of Fort Worth's plant is expected to save more than \$370 million during the manufacturing program of the Air Force's 1,388 F-16s. General Dynamics has invested more than \$100 million in new facilities, equipment and manufacturing technologies at the plant, while the Air Force has provided an additional \$25 million to the program.

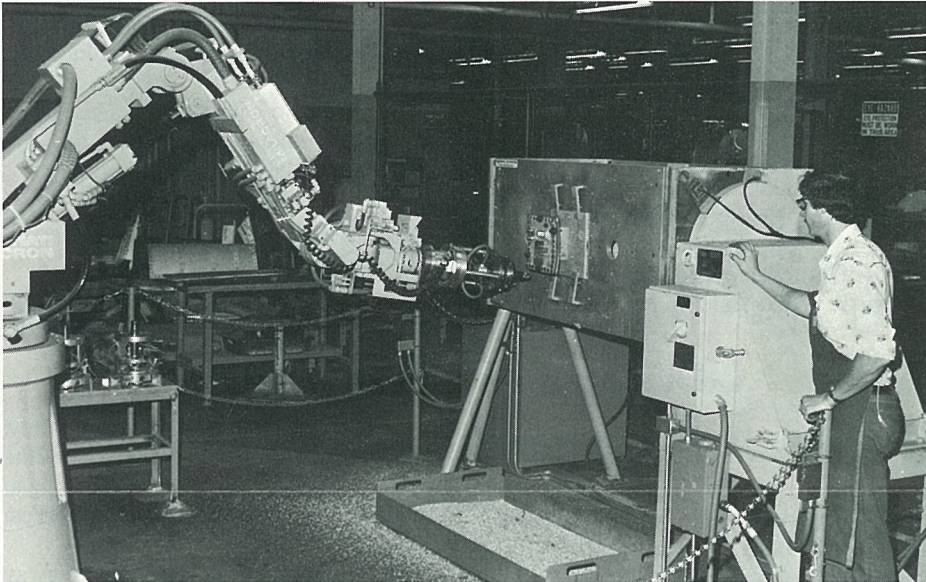
Although Fort Worth "was strapped with a fairly obsolescent factory, General Dynamics has established a very forward-looking manufacturing concept," said Maj. Gen. James A. Abrahamson, Director of the F-16 program.



Welcome, Indianapolis. Bundled against a light snowfall and bitter winds, 500 spectators crowd the Groton Submarine Base pier January 5 at commissioning of the USS Indianapolis (SSN 697), Electric Boat's fifth 688-class fast-attack submarine. Representative Andrew Jacobs Jr., Democrat of Indiana, was principal speaker at the ceremonies. With the Indianapolis, the U. S. Navy now has a total of 115 nuclear submarines in commission -- 74 attack-class subs and 41 fleet ballistic missile submarines.



Ocean-Ready. The Convair-built armored box launcher (inset) for Tomahawk cruise missiles is shown installed on the deck of the USS Merrill (DD 976) and awaiting sea trials. When deployed, these launchers would be installed in pairs on cruisers and Spruance-class destroyers. (See Story Page 1.)



Biting Metal. Looking like the arm of a giant octopus, one of Fort Worth's two robots positions itself to drill an F-16 panel, overseen by L. G. Rutledge, Dept. 31 rotary shaper, who commands the robot.

Two 'Smart' Robots at Fort Worth Help Produce F-16 Parts

Fort Worth has two robots helping to drill and rout F-16 parts.

These "smart" robots are not much like the humanoid R2D2 or C3PO in the movie "Star Wars." They are merely 10-foot-tall steel arms with elbows, wrists and heads that hold drills or routing tools. They are powered through hydraulic tubes running loosely along the length of the arms.

Unlike the "Star Wars" pair, these robots aren't very mobile. Their heavy steel bases, or shoulders, are bolted to the floor, and the only time they move their arms is when commanded by computer.

Fort Worth began building the robots about two years ago with the help of Data Systems Services. Fort Worth built the robots to perform several kinds of exacting routing and drilling tasks by making commercial robots smarter and more accurate with special tooling and microcomputers. Since September 1978, when the first one went on-line, the robots have produced many F-16 components.

"There are more than 200,000 holes for fasteners in each F-16," says Dean Golden, Program Manager, Robotics Applications. "Each one of them must be drilled to exacting specifications, and once the robot learns the job, we can program it to drill holes or rout down to tolerances of two-thousandths of an inch."

To learn their jobs, robots are more or less taken by the hand. A human operator leads the robot cutting head across to a masterplate covering the undrilled part. Step by step, the operator "teaches" the robot to drill each hole using the masterplate as a guide.

"Teaching the robots to drill or rout takes about a week," says Bob Taylor, Program Manager, Vertical Wing Skin. "But a program revision takes only about three days to learn."

Standing on a small ladder next to a robot as he spoke, Taylor punched buttons on a box in his hand. Behind him, the arm of the robot moved into position perpendicular to the jig-held masterplate. Taylor pressed another button. The robot lifted its elbow and, snakelike, stretched its forearm until it nearly touched the masterplate. Taylor then hand-guided the arm of the robot which carried a drill bit head the robot had snapped on itself.

When the drill was directly in front of the first masterplate hole, Taylor gave the robot a "drill" command. The head moved forward and emitted a short, swooshing sound. Moving slightly, it paused, reached back and again snapped forward... another rush of air... but no hole was bored through the masterplate. On the third try, the robot drilled through the masterplate into the vertical wing skin.

Savings And Stock Investment Values

The General Dynamics Savings and Stock Investment Plan unit values at the end of November were as follows:

Salaried	
Government Bonds	\$ 2.2579
Diversified Portfolio	1.5903
Fixed Income	1.0393
Hourly	
Government Bonds	2.2579
Diversified Portfolio	1.6272
General Dynamics Stock	\$47.42

Around the World... ...in GD

At CHQ: Charles Marquardt joined as Corporate Director, Financial Planning-Commerical... Leslie A. Slusher joined as Internal Auditor... Byron Vermillion transferred from Fort Worth as Corporate Pricing Analyst... Richard R. Allen transferred from Central Data Systems Center as Senior Electronic Data Processing Auditor.

At Fort Worth: Raymond J. Houston transferred from St. Louis as Publications Supervisor... Clinton C. Beyers transferred from St. Louis as Manager-F-16 Advanced Versions... Leroy B. Worrell was promoted to Assembly Manager.

At Pomona: John M. Faley and Harry Schwartz joined as Manager-Contract Administration... Richard W. Hadinger was promoted to Director-Facility Management and Plant Engineering... William H. From and William R. Yueh joined as Engineering Specialist... Leonard M. Stuessel was promoted to Director-Manufacturing... C. L. Jones joined as Quality Assurance Manager, Camden facility... Norm D. Barton was promoted to Assistant Director of Navy Marketing for Moderate Range Tactical Systems... Edward E. Douville was promoted to Marketing Manager, Phalanx Program.

At Electric Boat: John B. Sebastian Jr. was promoted to Assistant General Superintendent... William E. Graber was promoted to Manager-Radiological Control... Kenison A. McIntosh was promoted to Chief-Engineering... Thomas A. Peterson was promoted to Manager-Reactor Plant Services... Joseph A. Warner III was promoted to Manager of Cost Engineering... Edward J. Murray, D.O., joined as Quonset Point Medical Director.

At Stromberg-Carlson: Roy P. Croston and Allan R. Smith joined as Technical Staff Engineer... Robert J. Sankey joined as Principal Engineer... Robert C. Schwallie joined as Account Representative for Government/Industrial Marketing... Gerald A. Buhl joined as Senior Sales Engineer for Government/Industrial Marketing.

At DSS: James G. King transferred from St. Louis as Supervisor Data Systems at Central Data Systems Center.

At Material Service: John J. Urbancic was promoted to Director of Purchasing.

At GDCC. Michael A. Janas has been promoted to Vice President-Field Sales and Operations... Anthony J. Barca was promoted to Vice President-Eastern Area... Richard P. Mirabile was named Headquarters Manager, Technical Services-Analog and Electronic Systems.

At ATC: Don L. Foster joined as Director of Operations.

At Convair: Laval F. Lau was promoted to Director-Fabrication.

Delectable Doris Brings Back Memories of B-24 to Convair

Thousands of visitors turned out at San Diego's Lindbergh Field in mid-December to see an old friend when a B-24 Liberator bomber nicknamed Delectable Doris flew to the field—marking the 40th anniversary flight of the first B-24.

Delectable Doris, one of the last airworthy B-24s, allowed many of the visitors to remember the days in the early 1940s when Consolidated Vultee Aircraft Corp., now Convair Division, was assembling Liberators in record numbers.

At one time, as many as 45,000 employees were turning out Liberators and the equally famous PBX Catalina flying boat. In January 1944 alone, they produced 253 Liberators and 74 Catalinas.

Dubbed by some the Flying Barn, the B-24 was never accused of being a pretty airplane. Isaac Laddon, Consolidated's Chief Engineer, put together the XB-24 by taking 110-foot-long wings designed for the Catalina and hanging a box-like fuselage from them. The craft measured 63 feet from the tip of its nose to the end of its dual tails.

By today's standards, the Liberator's trip from the idea to the air over San Diego was made in unbelievable time. The milestones:

- At a January 1939 conference at Wright Field, Ohio, the Air Corps asked for a heavy bomber that would have a speed of 300 mph, a ceiling of 35,000 feet, and a 3,000-mile range.
- Preliminary specifications were drawn up on January 20, and the mockup was started before the end of the month.
- Wind tunnel tests were conducted and fabrication started in February.
- Contract for the prototype was signed on March 30.
- Wing and fuselage were ready for mating on October 26.
- Maiden flight was made on Dec. 29, 1939!

Following that first flight four decades ago, Convair and associated subcontractors built more than 18,000 of the planes, 6,726 of them at the San Diego plant alone, another 3,034 at Fort Worth.

Although primarily a heavy bomber, the B-24 was also used as a cargo plane, a tanker, a transport and an antisubmarine

reconnaissance aircraft. The plane was used by both the Army Air Corps and the Navy in every theater of World War II—the Pacific, Europe, North Africa and China-Burma-India. In addition, B-24s were flown by a number of other countries, including England, Canada, Australia, India, China, Czechoslovakia, France, Holland and South Africa.

Only eight of the more-than 18,000 B-24s are still known to exist. Other B-24s are at the Pima County Air Museum in Tucson, Ariz.; Lackland AFB, Tex.; the Air Force Museum near Dayton, Ohio; Toronto (Canada) Air Museum; Duxford Field, England (a former RAF Field); Poona, India, and Harlingen, Tex.

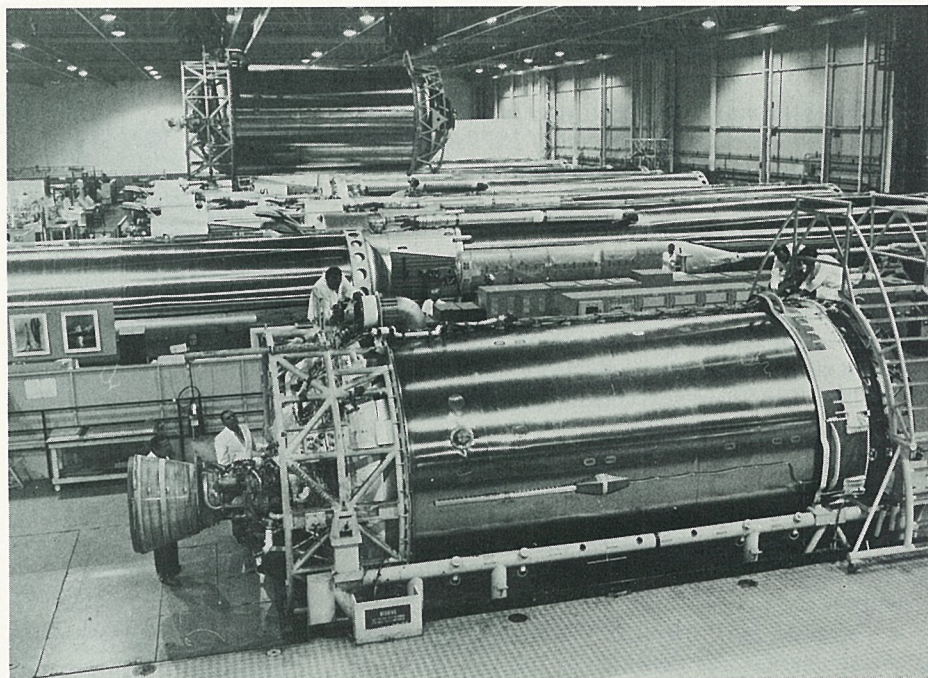
Owen Clarke, executive director of the San Diego Aerospace Museum, helped make the arrangements to have the Delectable Doris flown to San Diego from its home near Barstow, Calif. Clarke, a retired Air Force colonel, flew both the B-24 and the B-17 during the war. He said the B-24 was "a truck driver's plane" compared to the more comfortable "gentleman's" B-17.

"But I really like flying the Liberator," Clarke said. "It carried a big bomb load; it was basically a platform to carry bombs, gas and guns. It was a rugged plane; it could take a real beating, absorb a lot of flak."

Delectable Doris was built at Convair's Fort Worth plant (now GD's Fort Worth Division) and delivered to the RAF Air Command, South East Asia, in late 1944. After World War II, she and 11 others were transferred to the Indian Air Force.

In 1969, India retired the Liberators from service, and Doris was purchased by David Tallichet, a Los Angeles businessman, in 1973. In 1975, Delectable Doris was flown to the United States.

General Dynamics and Rohr Industries donated the money to bring the B-24 to San Diego. Tallichet said because of the difficulty of getting spare parts, the plane is flown now only for special events, "not to mention that the four engines burn a total of 200 gallons of gas an hour. Considering the cost of gas, I don't go flying just for fun," he said.



Final Touches. Convair engineers prepare to lift a Centaur upper stage and complete pressurizing and system test work before it is trucked with an Atlas booster to the launch site. (See Story Page 1.)

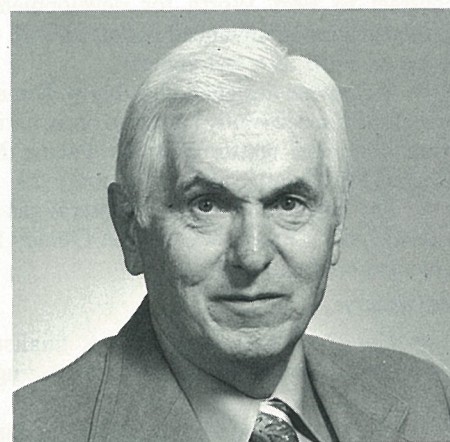
Sid Wilkinson Is Appointed VP of Operations at Convair

Sid Wilkinson, a veteran of 43 years in the aerospace industry, has been appointed Vice President - Operations for Convair.

In his new capacity, he will be in charge of all factory operations, including production of cruise missiles for the Navy and Air Force, DC-10 fuselages for McDonnell Douglas and Atlas/Centaur space boosters.

From 1976 through 1978, Wilkinson was Vice President of Operations at Fort Worth Division, where he guided the F-16 program from development to production. More recently, he has been consulting for General Dynamics as a manufacturing specialist.

Before joining General Dynamics, Wilkinson was Vice President of Operations for McDonnell Aircraft Co. in St. Louis. Beginning in 1949, when he was promoted to McDonnell's general factory superintendent, he was directly responsible for the production of a number of famous



Sid Wilkinson

aircraft—the F-2 Banshee, the F-3H Demon, the F-101 Voodoo, the F-4 Phantom and the F-15 Eagle.

He has a degree in mechanical engineering from New York's Pratt Institute.

Bostwick Honored At WW II Fighter Rollout Ceremony

George Bostwick, a Fort Worth Material Project Manager, was an honored guest recently at a rollout ceremony at Kelly AFB, Tex., for a restored World War II German Me-262 jet fighter.

The Me-262, the world's first operational jet fighter, was restored by U.S. Air Force Reservists and is one of only nine remaining Me-262s out of more than 1,400 that were built during the war. It will be displayed at the Air Force Museum at Dayton, Ohio.

Bostwick, a retired Air Force colonel, is one of a handful of Allied pilots who downed Me-262s during the war. He is a triple ace—15 aircraft destroyed, seven damaged—and shot down a Me-262 in the closing days of the war. His slower P-47 Thunderbolt caught a jet shortly after it had taken off from a field near Berlin.

Thomas S. Wied Named Pomona Vice President

Thomas S. Wied has been appointed Division Vice President - Contracts and Estimating at Pomona Division.

Wied formerly was Director of Contracts in St. Louis.

In his new position, Wied will be responsible for directing and coordinating all work on contracts and customer cost estimating activities at the Pomona Division.

Wied, 40, joined the company in 1961 at the Convair Division in San Diego and since then has held a number of increasingly important positions at the division and at corporate headquarters.



Liberator Returns. Delectable Doris, one of the few B-24 Liberators remaining of the 18,000 that were produced in the early 1940s, flew to Lindbergh Field marking the 40th anniversary of the first flight of an XB-24.

McGoodwin Named Brigadier General

James B. McGoodwin, a Fort Worth project industrial engineer, has been promoted to the rank of brigadier general in the Texas National Guard.

A Korean War veteran, McGoodwin joined the Texas National Guard in 1958 and has served in a number of command and staff positions since that time. He commanded the Third Brigade of the 49th

Armored Division and is presently Assistant Division commander of the 49th.

Foundation Cites Employee's Work

Joyce Jaskolski, administrative assistant to Contracts Manager R. J. Walter at Electronics Division, has been named "Dama de Distincion" by the Mexican and American Foundation.

Jaskolski was cited for her contributions to the association in fund-raising and in her work as chairman of the Seating and Host Committee for the association's annual "Evening With The Stars" fund raiser.

The Mexican and American Foundation is a San Diego organization dedicated to increasing cooperation and understanding between the English- and Spanish-speaking communities of the border area.



Col. Jessie J. Bass Jr.

Col. Bass Named To Contract Post At Kearny Mesa

U. S. Air Force Col. Jessie J. Bass Jr. is the new commander of the Defense Contract Administration Services Plant Representative Office at Convair.

His office helps General Dynamics achieve accurate and timely compliance with the requirements of Department of Defense and National Aeronautics and Space Administration contracts at the Convair and Electronics divisions.

Col. Bass was previously deputy for integration/commonality of the Joint Cruise Missile Project, Arlington, Va.

A native of North Carolina, Col. Bass obtained a Bachelor of Science degree in Electrical Engineering from North Carolina A&T State University in 1957. He also earned a master's certificate in astronautical engineering from the Air Force Institute of Technology, Dayton, Ohio, and was graduated from the Industrial College of the Armed Forces.

The colonel began his career as an electronics engineer with the National Security Agency at Ft. Meade, Md. He also served for six years in various assignments at the Air Force Space and Missile Systems Organization in El Segundo, Calif.

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'79 Was General Dynamics' Most Successful Year

1979 was the most successful year in the history of General Dynamics. A partial list of 1979 highlights demonstrates the diversity and vitality of the corporation.

January:

- On January 4, the GD Board of Directors voted to resume regular quarterly dividends on the company's common stock, on which no dividends had been paid since 1970. The Board also voted a split of the common shares in a ratio of 2½ for 1.
- General Dynamics Services Co., a wholly owned subsidiary, was formed to provide technical and operational support services on a worldwide basis.
- The first operational F-16 was delivered to the 388th Tactical Fighter Wing at Hill AFB, Utah, on January 6.
- The *New York City* (SSN 696) 688-class fast-attack submarine was delivered to the U.S. Navy on January 23.
- The Belgian Air Force's first single-seat F-16 successfully completed its maiden flight at Gosselies, Belgium, on January 25.
- The U.S. Department of Defense honored GD's Fort Worth Division for its commitment to use minority businesses as subcontractors on high-technology programs.
- The U.S. Air Force awarded a \$34.4 million contract to Fort Worth for development and flight demonstration of advanced fighter aircraft technologies using an F-16 as a test vehicle.
- A Convair-designed U.S. Navy Tomahawk cruise missile was successfully launched on an antiship mission from a ground platform at the Pacific Missile Test Center, Pt. Mugu, Calif., on January 29.
- The keel of the liquefied natural gas tanker to be named *Lake Charles* was laid at Quincy Shipbuilding Division on January 30.

February:

- The F-16 was chosen as a finalist in Spain's competition for a new fighter aircraft during the week of February 23.
- The corporation announced that its earnings for the fourth quarter of 1978 were \$48.3 million, or \$4.49 per share, on sales of \$898 million. Both were records for any three-month period in the company's history.
- Convair received a contract from Boeing Commercial Airplane Co. to build engine struts for 400 new Boeing 767 wide-bodied, twin-jet aircraft.

March:

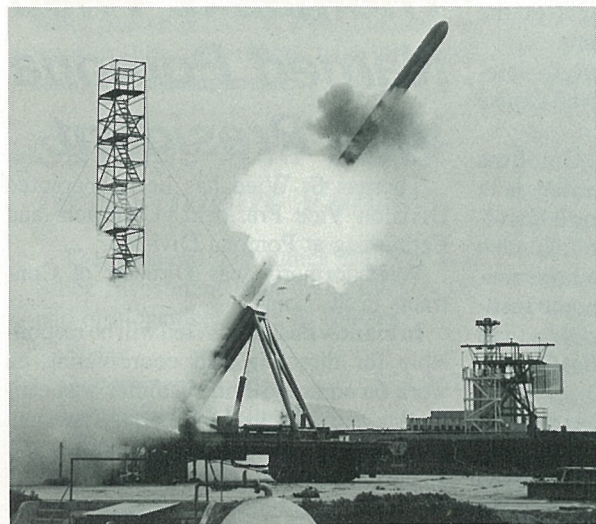
- Six General Dynamics divisions, subsidiaries and plants earned the Chairman's Award for Excellence in Safety and Performance for 1978. They were Convair, Electronics, DatagraphiX, Fort Worth, Pomona and Stromberg-Carlson's Sanford, Fla., facility.

April:

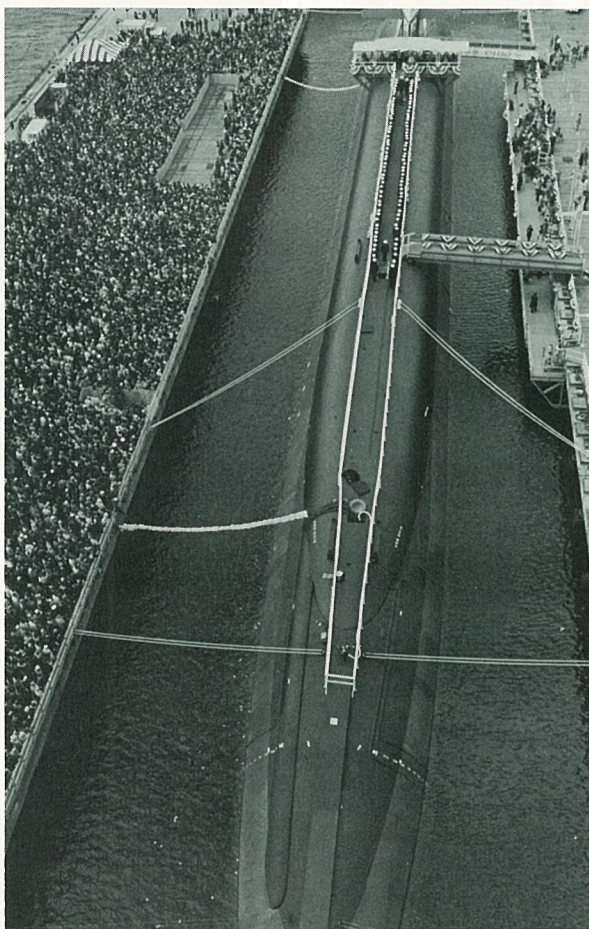
- LNG Libra* was named at Quincy on April 6.
- The first Trident submarine, the *Ohio* (SSBN 727), was christened by Mrs. Annie Glenn, wife of Ohio Senator John Glenn, and the keel of another Trident, the *Georgia* (SSBN 729), was laid by First Lady Rosalynn Carter at dual ceremonies at Electric Boat on April 7.

May:

- GD reported its first quarter earnings in 1979 were \$29.5 million, or \$1.08 per share, nearly 49 percent higher than the earnings reported for the same period last year. Sales amounted to \$895.6 million.
- An Atlas/Centaur space vehicle, carrying a Fleet Satellite Communications payload, was launched on May 4, marking the 50th launch of the Atlas/Centaur combination over the past 17 years.
- The U.S. Army awarded Pomona Division an \$82.8 million contract to manufacture 2,678 Stinger shoulder-fired, surface-to-air missiles.
- Electric Boat received a \$265.2 million contract to build two more 688-class submarines, bringing the total to 20.



Convair's Cruise Missile



Electric Boat's Trident Submarine

June:

- The F-16 entered service with the Royal Netherlands Air Force on June 6 with the ahead-of-schedule delivery of the first two Dutch-assembled aircraft at the Fokker-VFW plant.
- Thousands of spectators watched as the F-16 was put through its paces by two GD pilots at the Paris Air Show, June 8-17.
- Stromberg-Carlson announced the Push-Pulse Telephone.
- The U.S. Navy awarded Pomona a \$95 million contract for full-scale engineering development of the RAM guided missile weapon system after the governments of the United States, the Federal Republic of Germany and Denmark agreed to jointly sponsor development of the shipboard system.

July:

- A Convair AGM-109 made a successful flight after being launched over Utah from a B-52 bomber on July 17 on the first flight of the U.S. Air Force's air-launched cruise missile (ALCM) competitive flyoff.
- General Dynamics Communications Co. received a contract to make a corporate-wide analysis of GD telecommunications services and equipment and to make recommendations for a central system to connect all General Dynamics offices.

August:

- The corporation's earnings for the second quarter were \$47.8 million, or \$1.77 per share, a record for the period and 56 percent higher than earnings from operations in the same period 1978.
- The first production unit of the Phalanx close-in ship defense gun system was rolled out at Pomona during ceremonies at the plant on August 9.
- The high-speed attack submarine *La Jolla* (SSN 701) was launched August 11.

September:

- Atlas/Centaur launched NASA's third High Energy Astronomy Observatory from Cape Canaveral.
- Air Force Gen. Alton D. Slay, Commander of the Air Force's Systems Command, sent GD a message commending the F-16's zero defects record.
- Pioneer 11, launched on April 5, 1973, by Atlas/Centaur, encountered the giant ringed planet Saturn after a two-billion-mile space odyssey across the solar system.
- Marblehead Lime, the nation's largest lime producer, began installing the world's largest lime kiln in its South Chicago plant.
- Quincy received a \$24 million contract for dry dock and overhaul of USNS *Neptune*, an ocean cable-laying ship.

October:

- Stromberg-Carlson received a contract for a 1,000-line System Century Digital Central Office (DCO) to be installed in Colombia, South America.
- Data Systems Services activated two earth stations to transmit and receive data via satellite between its offices in California and Connecticut.
- Fort Worth's Philip F. Oestricher, the first pilot to fly the F-16, and Air Force Lt. Col. Robert C. Ettinger, Director of the F-16 Joint Test Force at Edwards AFB, Calif., were selected as America's Top Test Pilots of 1979 by the Society of Experimental Test Pilots.

- A series of survivability tests using Electronics' Range Measuring System (RMS) were carried out in Fort Hunter Liggett, Calif. RMS, built for the U.S. Army, is the basis for an instrumentation system which allows pilot training to take place in realistic situations.

November:

- A Convair/U.S. Navy Tomahawk sea-launched cruise missile made a successful flight after a launch from a torpedo tube of the submarine USS *Guitarro* November 7. It was the 14th underwater launch and 48th test flight for the missile.
- DatagraphiX shipped its 1,000th Model 4500 computer output microfilm recorder on November 15.
- Material Service delivered nearly 4,000 cubic yards of concrete in a single day to a Chicago area building site on November 17.
- GD's earnings for the third quarter of 1979 were a record \$50.1 million, or \$1.86 per share, compared with earnings in 1978 third quarter of \$39.8 million, or \$1.50 per share.
- U. S. Air Force units flying Fort Worth-built FB-111A strategic bombers and F-111D fighter-bombers took first places in the Strategic Air Command's Giant Voice '79, a precision bombing and navigation competition.
- EB was awarded a \$63.5 million contract for engineering, integration and technical support of the command and control system on Trident submarines.
- Six F-111D fighter-bombers completed successful deployment to the Far East for joint operations with U.S. Air Force and Republic of Korea Air Force units prior to returning to their home base at Cannon AFB, N. M.
- The Guam Telephone Authority awarded Stromberg-Carlson a \$2.4 million contract to install a System Century DCO.

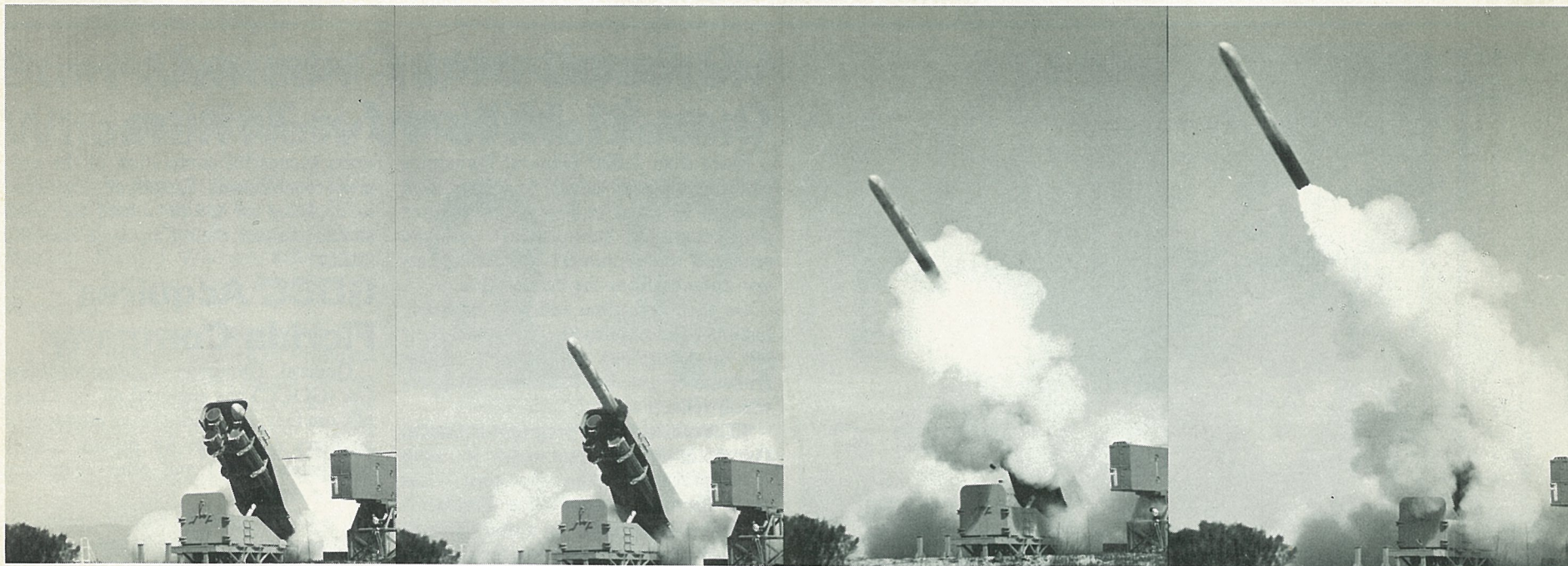
- The Fleet Combat Direction Systems Training Center at Virginia Beach, Va., received Pomona's first Phalanx.
- F-16s participating in the Tactical Air Command's Red Flag training program completed the two-week exercise with flying colors.
- Stromberg-Carlson's 100th DCO was delivered to Cranes Mill, Tex., for the Guadalupe Valley Telephone Cooperative, Inc. It was a 3,000-line system with 11 Digital Satellite Units.
- Construction of Freeman United's Crown III underground mine near Springfield, Ill., progressed on schedule. Shipments will begin in late 1980 to Hoosier Energy, a Midwestern utility company, which has purchased a major amount of the mine's planned production.
- After receiving high marks on her sea trials two weeks earlier, *LNG Virgo* was named at Quincy Shipbuilding ceremonies on November 28.
- The Australian government announced the F-16 would be a finalist in the selection of a new tactical fighter for its air force.
- Stromberg-Carlson cut over the largest Class 5 DCO in the U.S. -- a 7,000-line system for the Fort Bend Telephone Co., Katy, Tex., on November 30.

December:

- The high-speed attack submarine *Phoenix* (SSN 702) was christened during ceremonies at Groton on December 8.
- Quincy was awarded a \$23 million contract for the construction of two oil barges for Bulkfleet Marine Corp., of Houston, Tex., to be delivered in 1980.
- Electronics Division manufactured and delivered 13 Avionics Intermediate Shops to the U.S. Air Force in 1979. The shops, designed to test the avionics systems of the F-16 Multirole Fighter, are currently used at Hill AFB, Utah; Lowry AFB, Colo., and MacDill AFB, Fla. Others are supporting F-16 programs in Belgium, the Netherlands, Denmark and Norway.



Fort Worth's F-16s



A Tomahawk cruise missile emerges from the armored box launcher at Point Mugu, Calif.

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Pomona Awarded \$21 Million Contract On Antitank Weapon

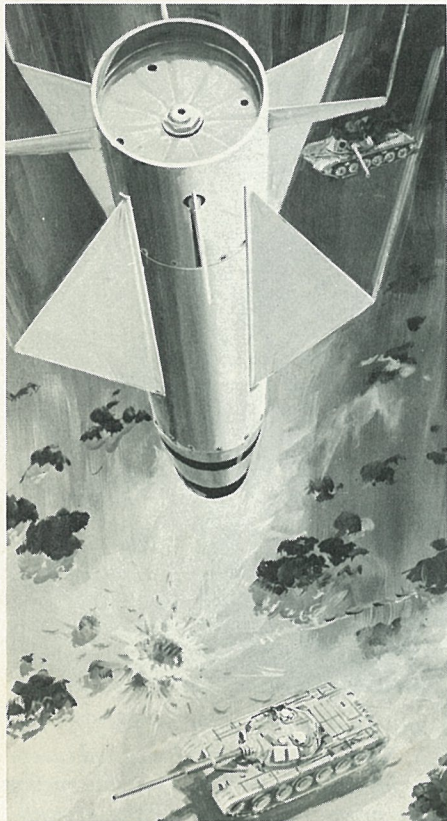
The U.S. Army Missile Command (MICOM) has awarded Pomona Division a \$20.9 million contract to provide infrared terminally guided submissiles for the flight demonstration phase of the Assault Breaker program.

The Assault Breaker program is a new antiarmor warfare concept which uses precision guided submissiles. The terminally guided submissiles will be carried in a larger missile, which will be launched and guided to a general target area. A dispenser on the larger missile will then deploy the submissiles against enemy armor.

Under terms of the contract, the General Dynamics-developed submissiles will demonstrate their inflight capability to be launched from the carrier missile, autonomously acquire targets and guide themselves to impact. In addition, the tests will demonstrate the successful integration of Assault Breaker's system elements.

In a recent test, a Pomona-designed submissile was released from a helicopter and scored a direct hit on a tank, demonstrating the feasibility of autonomous inflight acquisition of a target by a submissile and subsequent homing guidance to impact.

The infrared seeker used in the submissiles is based on the seeker used in Stinger, a shoulder-fired antiaircraft weapon now in production at the Pomona Division for the Army.



An Artist's Concept of Assault Breaker



Minister's Visit. D. James Killen, Australian Minister for Defence, is briefed on the cockpit of an F-16 by GD Test Pilot Jim McKinney (right) during the minister's recent visit to Fort Worth Division. The F-16 is one of two finalists in Australia's competition for a new tactical fighter for the Royal Australian Air Force.

Australia's Defence Minister Inspects F-16 at Fort Worth

D. James Killen, the Minister for Defence of Australia, toured the F-16 assembly line and climbed into the cockpit of the advanced Mach 2-plus fighter during a visit to Fort Worth Division on February 28th.

The F-16 is one of two finalist aircraft in Australia's competition to select a new tactical fighter for the Royal Australian Air Force (RAAF).

Killen visited the home of the F-16 fighter while in the United States to attend the 29th annual meeting of the ANZUS Council. The ANZUS partnership joins Australia, New Zealand and the United States in a common effort for defense in the Pacific.

During his visit to Fort Worth's mile-long aircraft manufacturing facility, Killen and his party viewed work under way on more than 100 F-16 multimission fighters for the U.S. and Israeli air forces. Killen also examined F-16 structural components which are candidates for manufacture by Australian industry. Components of F-16s for the Belgian, Danish, Dutch

and Norwegian air forces are produced in Fort Worth as well as in Europe, with final assembly of those aircraft on production lines in Belgium and the Netherlands. If Australia selects the F-16, Government Aircraft Factories would assemble the RAAF's fighters at its facility near Melbourne.

Before departing the General Dynamics complex, which also produced Australia's F-111C fighter-bombers, Killen and his party witnessed an F-16 flight demonstration by Chief F-16 Test Pilot Neil R. Anderson. The General Dynamics test pilot began the flight program with a short take-off and a maximum power vertical climb to demonstrate the F-16's high thrust-to-weight ratio.

Accompanying Killen on the tour of the F-16 manufacturing plant were Donald E. Eltringham, Deputy Secretary for Defence; Australian Air Vice Marshal David Evans, Chief of Air Force Operations, and Wing Commander Douglas Edwards, Assistant Air Attache at the Australian Embassy in Washington, D.C.

Quincy to Name 9th LNG Tanker

Quincy Shipbuilding Division's ninth liquefied natural gas tanker will be named *LNG Lake Charles* during ceremonies April 18th at the shipyard.

Richard L. O'Shields, Chairman and Chief Executive Officer of Panhandle Eastern Pipe Line Co., will deliver the principal address at the 5:30 p.m. ceremonies. His wife, Shirley, will sponsor the 936-foot, 95,000-ton vessel.

Other officials participating in the ceremonies include David S. Lewis, General

Dynamics' Chairman and Chief Executive Officer; P. Takis Veliotis, Executive Vice President - Marine for General Dynamics, and Joseph H. Lennox, Quincy Shipbuilding General Manager.

LNG Lake Charles and a sister ship, both scheduled for delivery later this year, will transport liquefied natural gas from Algeria to Lake Charles, La. Seven other sister ships, all built at Quincy, are carrying liquefied natural gas from Indonesia to Japan.

Cruise Missile Fired from ABL At Point Mugu

The first firing of a U.S. Navy/General Dynamics Tomahawk cruise missile from an armored box launcher (ABL) was successfully made from the Pacific Missile Test Center at Point Mugu, Calif., on March 13th.

The test firing was a major step in validating the ABL concept in preparation for the first shipboard firing of a Tomahawk from an operational destroyer.

In the test, the armor-plated, four-tube launcher was mounted on the ground at the test center to simulate a shipboard launch. Following the successful firing, the missile carried out an antiship mission on the Sea Test Range off the coast of southern California. The flight was the 49th for a Tomahawk missile.

After completion of the test flight, the missile was recovered on land at San Clemente Island and will be used again in the Tomahawk test program.

In shipboard use, the Convair-built launcher will be deck-mounted and will store four fully fueled and armed missiles secured and ready for firing. Planning calls for the launcher system to be installed on selected U.S. Navy destroyers and cruisers.

Two ABLs have been built to date: the first was the system used in the Point Mugu test; the other has been installed on the destroyer USS *Merrill* (DD 976) and will be used for the first firing at sea.

Two Submarines Slated for Launch At Groton in April

Electric Boat Division will mark the month of April 1980 by launching two submarines within a period of eight days.

On April 19th, the *Boston* (SSN 703), a 688-class fast-attack submarine, will slide into the Thames River at Groton, and one week later, on April 26th, the division will launch the second Trident ballistic missile submarine, the *Michigan* (SSBN 727).

The *Boston* will be the 11th 688-class ship to be launched at Electric Boat and will join five others undergoing final outfitting and testing at the shipyard after launch. The division has already delivered five of the advanced, high-speed submarines to the U.S. fleet.

The 360-foot-long, 6,900-ton attack submarines are designed and equipped to hunt down and destroy enemy ships. They are manned by a crew of 12 officers and 115 enlisted men.

The Trident submarines, 560 feet long and displacing about 18,750 tons, are the largest submarines ever built. Manned by a 154-man crew, each Trident will carry 24 advanced, long-range ballistic missiles. The first Trident, the *Ohio* (SSBN 726), was launched at Groton on April 7, 1979.

Seven Tridents are currently under construction at Electric Boat. Eight other 688-class ships are in various stages of production at the shipyard prior to launch.



An Artist's Concept of an AFTI/F-16

Air Force F-16 Being Converted To Fighter Technology Test Bed

The U.S. Air Force has delivered to Fort Worth Division an F-16 fighter which will be used as a test bed for the development and flight demonstration of new fighter aircraft technologies under the Advanced Fighter Technology Integration (AFTI/F-16) Program.

The AFTI/F-16 Program is directed by the Air Force Systems Command's Flight Dynamics Laboratory at Wright-Patterson AFB, Ohio. General Dynamics was awarded a \$34.3 million prime contract for the program in December 1978.

In ceremonies March 6th on the Fort Worth flight line, General Dynamics AFTI/F-16 Program Manager Max Wad-doups accepted the developmental F-16 fighter from Col. Robert C. Barlow, Director of the Flight Dynamics Laboratory, and Lt. Col. Arthur J. Bianco, AFTI/F-16 Program Manager. The former AFTI/F-16 Program Manager, Col. Ernest F. Moore, also was present for the important milestone.

The AFTI demonstration aircraft will be modified extensively at Fort Worth to incorporate new aerodynamic and control technologies. It is scheduled to begin a flight test program at Edwards AFB, Calif., in July 1981.

"The sole purpose of the AFTI/F-16 Program is to develop and evaluate promising technologies to provide future tactical fighter options," said Col. Bianco.

New technologies scheduled to be developed during the program include

6 GD Operations Win Safety Award

Six General Dynamics divisions, subsidiaries and facilities earned the Chairman's Award for Excellence in Safety Performance for 1979.

Convair, DatagraphiX, Electronics, Fort Worth, Marblehead Lime and the Charleston facility of Quincy Shipbuilding have compiled safety records which were substantially better than the average for their industries and conducted active and comprehensive loss control programs which met or exceeded corporate standards for the year.

On a corporate-wide basis, lost work-day and recordable injury incidence rates were, respectively, 39 percent and 22 percent better than weighted averages for the industries in which GD is engaged.

Savings And Stock Investment Values

The General Dynamics Savings and Stock Investment Plan unit values at the end of January were as follows:

Salaried:	
Government Bonds	\$ 2.3043
Diversified Portfolio	1.7329
Fixed Income	1.0559
Hourly:	
Government Bonds	2.3036
Diversified Portfolio	1.7688
General Dynamics Stock	80.38

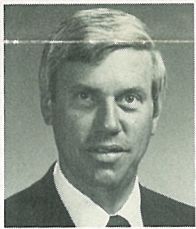
advanced maneuvering capability, digital flight controls, an integrated flight and weapons fire control system and pilot-aircraft interface improvements.

Information generated by the AFTI/F-16 Program will be made available to the U.S. aircraft industry so that the newly proven technologies may be applied in the design of future generations of fighter aircraft.

Carlson Promoted To Management Development Post

Donald M. Carlson, formerly Director of Industrial Relations at Pomona, has been appointed Corporate Director of Executive Development in St. Louis.

He has responsibility for the training and development of General Dynamics management personnel throughout the corporation.



Carlson

Carlson joined General Dynamics in 1959 as a technical aide at Electric Boat Division in Groton, Conn., and served for 11 years in a variety of increasingly responsible management positions. He also served in personnel management at the Electro Dynamic facility in Avenel, N.J., and at corporate headquarters.

He attended the U.S. Coast Guard Academy and received his Bachelor of Science degree in education and psychology from Western Michigan University in 1959 and his Master of Business Administration degree from the University of Connecticut in 1965.

John Kane Appointed GD's Liaison to NAB

John C. Kane, GD Corporate Director of Administration, has been selected as a corporate liaison to the National Alliance of Businessmen (NAB).

Kane, along with representatives from other large corporations, will give advice and help in planning NAB programs which find jobs for the unemployed.

At a meeting of the corporate liaisons held in Washington, D.C., NAB Chairman John H. Filer, Chairman of Aetna Life & Casualty, said, "If public problems are not solved (with the help of private enterprise), we will not have an environment in which our businesses have hope of being successful and profitable in the future."

Filer warned that "one of the greatest threats to the successful continuance of the private enterprise system is the existence of public social problems that have not been solved."

The NAB is an independent, nonprofit corporation which works in partnership with government, labor, education and business groups to reduce unemployment.

GD Employees Received Over \$1 Million for Tuition

More than 2,000 General Dynamics employees from coast to coast took courses at local colleges, universities and vocational schools last year and received more than \$1 million in tuition refunds from the corporation.

On their own time and with company backing, the employees increased their job qualifications or pursued undergraduate or advanced academic degrees which related to their jobs.

"The tuition refund program at General Dynamics makes good sense for both the employee and the corporation," said Arch Rambeau, Staff Vice President, Personnel Relations. "In a time of rapid technological development, employees need to insure their skills and expertise do not fall behind and become obsolete. For the corporation, the program means insuring that in-house talent is current with the latest developments in a variety of fields."

Under the tuition refund program, in 1979 the corporation paid out \$1,162,331 for tuition costs of 2,327 employees who attended accredited colleges or universities or approved vocational schools. Courses of study eligible for the refund are limited to work-related subjects or degrees, and the refund is dependent

upon successful completion of the program requirements. Employees interested in applying for tuition refund for 1980 should contact their Employee Benefits Office.

GDCC Acquires Florida Company

General Dynamics Communications Co. (GDCC) has acquired all the shares of Com Dev, a Florida-based producer of auxiliary equipment for private branch exchanges (PBX) and other telephone related systems.

Com Dev currently employs about 80 persons and is located in Sarasota, Fla. It was founded in 1974 and had sales of approximately \$3 million last year.

F-16s Scheduled For Europe in 1981

The U.S. Air Force will begin basing F-16 squadrons in West Germany by mid-1981, according to the Department of Defense.

Three squadrons of F-16s will be deployed to Hahn AB, West Germany, to replace aging F-4B Phantoms. About 72 F-16 multimission fighters will be stationed at Hahn.

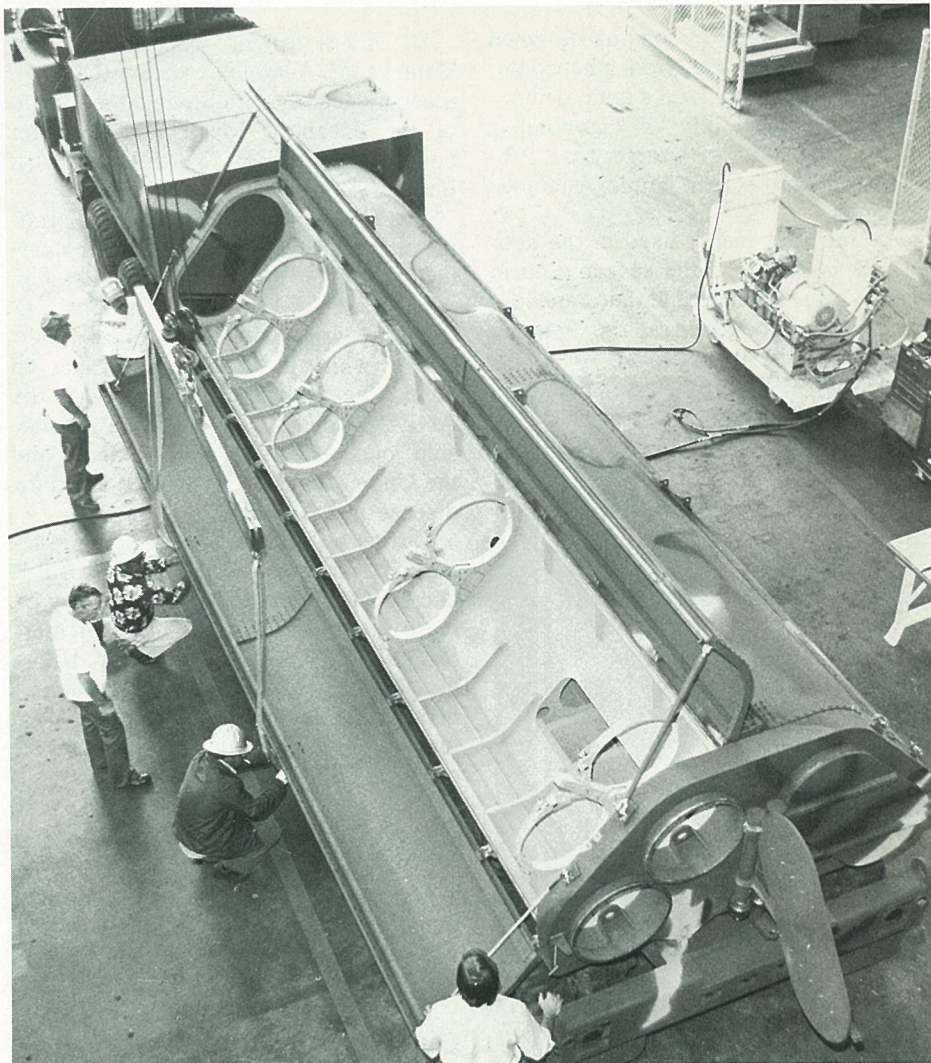
General Dynamics EEO Commitment

Equal Employment Opportunity continues to be an important and integral part of our management philosophy at General Dynamics. We recruit, hire, train and promote persons in all job classifications without regard to race, color, religion, sex, age or national origin and base decisions on employment so as to further the principle of Equal Employment Opportunity. We will discharge, as well, our obligations with respect to the handicapped and veterans. It is our job to insure that all personnel actions will be executed and administered on that basis.

As a result of our policy and practice of according Equal Employment Opportunities to all, we have made significant progress in increasing the representation of minority groups and women at all levels throughout the company. We must continue our commitments to Affirmative Action at every General Dynamics' operation and facility and see to it that equal opportunity exists in fact as well as in policy. I am committed, and I expect all members of our management team to be similarly committed.

D.S. Lewis

David S. Lewis
Chairman



Making Ready. Convair technicians install the final access door on the first test transporter-erector-launcher (TEL) for the U.S. Air Force's ground-launched cruise missile. The TEL carries four Tomahawk cruise missiles and will be used this spring for a live firing test. General Dynamics is the prime contractor for the ground-launched cruise missile.

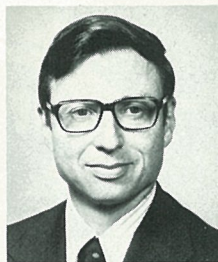
Starr Named F-16/79 Director; Wheaton New VP of Marketing

Sterling V. Starr, a Fort Worth Division Vice President, has been appointed Director of the F-16/79 Export Fighter Program. David J. Wheaton will replace Starr as Division Vice President of Marketing.

The proposed export fighter, or F-X as it is called, has been defined by President Carter as an intermediate fighter "whose cost and performance characteristics would generally lie between our current export fighter, the F-5E, and fighter aircraft now in production for U.S. forces, such as the F-16."

General Dynamics' design for the export fighter, the F-16/79, combines the basic F-16 multimission fighter airframe and equipment with an 18,000-pound-thrust General Electric J79 turbojet engine. The standard F-16 uses a 25,000-pound-thrust Pratt & Whitney F100 turbofan engine. The F-16/79 would weigh somewhat more than the standard F-16 and would have a shorter combat range, but it features lower acquisition cost, early availability and low-risk development for countries seeking an advanced fighter.

Starr, 49, is a veteran of 27 years with General Dynamics. He joined Convair



Starr



Wheaton

Division in 1953 as a dynamics engineer and moved to corporate headquarters in 1970 where he served as Staff Vice President-Corporate Planning. In 1976, he transferred to Fort Worth as Vice President-Marketing. He is a native of Alliance, Ohio, and was graduated from Ohio State University in 1953 with Bachelor of Science and Master of Science degrees in aeronautical engineering.

Wheaton, 39, was formerly Director of F-16 Marketing. He has 13 years of engineering and marketing experience with Convair and Fort Worth divisions and 14 years of active and reserve experience as a pilot in the U.S. Navy. A native of Las Vegas, N. M., Wheaton was graduated from the University of Colorado in 1962 with a Bachelor of Science degree in aeronautical engineering.

Employees Honored For Suggestions By National Group

Fort Worth's Clyde W. Becker and Carol J. Kafer have received citations from the National Association of Suggestion Systems for their suggestions which led to cost savings for the division in 1979.

Becker, who retired last year as senior manufacturing research engineer, suggested use of a low resin content, pre-pregnated graphite/epoxy material for graphite composite parts instead of material with high resin content. The use of the high resin material required many plies of bleeder cloth to absorb excess resin during the curing process. His innovation in composite manufacturing is now being adopted industry wide. Becker earned a maximum \$5,000 for his first year savings of \$819,696.

Kafer, an electrical harness assembler, suggested the vendor of electrical wafer plugs leave the thermo-plastic sealing ring off the plug terminals and put them instead in the solder sleeve. In addition to saving labor costs in the assembling of electrical harnesses, it also allowed the vendor to replace a hand operation, installing sealing rings on plug terminals, with a machine operation, installing sealing rings in solder sleeves; the vendor reduced his price accordingly. First year savings were \$343,488; Kafer also earned the maximum award of \$5,000.

Last year, 1,372 employees of the Fort Worth Division earned \$191,445 for their suggestions, which produced first year savings totaling \$4,243,416 for the division.

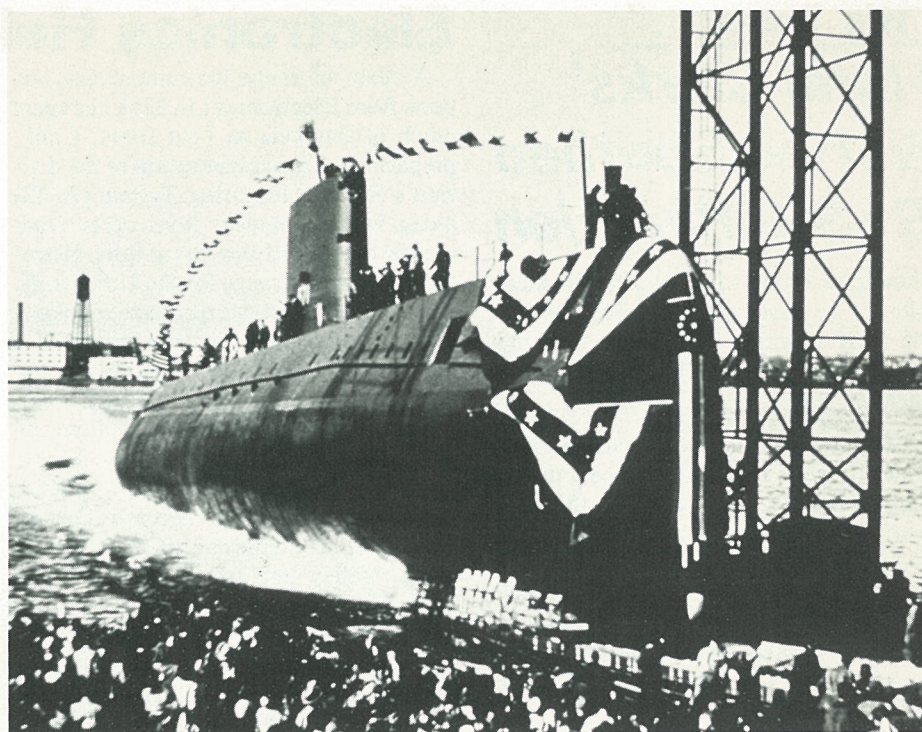
Cushman Dow Elected President San Diego Chamber of Commerce

Convair General Counsel H. Cushman Dow has been elected President of the San Diego Chamber of Commerce.

Dow, who had been the chamber's

First Vice President, will head the 2,500-member group for one year and represent the San Diego business community. He also is a member of the Board of Directors and serves on the chamber's Executive Committee.

Dow has been Convair's General Counsel since joining General Dynamics in 1962. He holds a Bachelor of Arts degree from Yale University and a Bachelor of Law degree from Harvard University. He is a member of the American Bar Association, the Federal Bar Association, the San Diego County Bar Association, the California Manufacturers Association and the World Affairs Council.



The Nautilus Launching, Jan. 21, 1954

History-Making Career Ends For First Nuclear Sub, Nautilus

The grand old lady of the U.S. Navy's nuclear submarine fleet, USS *Nautilus* (SSN 571), officially retired earlier this month, ending a 25-year career that ushered in a new era of technology and made the pages of Jules Verne come alive.

The Electric Boat Division-built vessel, the first nuclear-powered ship in the world, was decommissioned at Mare Island Naval Shipyard in California, sparking memories for many on hand for the ceremonies.

The story of the *Nautilus* is closely tied to Electric Boat. The keel for the 320-foot vessel was laid at Groton on June 14, 1952, by President Harry Truman.

"The day the propellers of this submarine first bite into the water," President Truman said in his address that day, "... will be the most momentous day in the field of atomic science since that first flash of light down in the desert seven years ago. Then we knew we had a bomb for war. Now we will have a working power plant for peace."

ALCM Engines In Long-Term Storage Test

The U.S. Air Force has begun an unusual 30-month storage test of two air-launched cruise missile (ALCM) maintenance-free engines.

The F107 engines, built by Williams Research Corp., of Walled Lake, Mich., are used on the Convair-built AGM-109 cruise missile and the Boeing AGM-86. The missiles are currently being evaluated by the U.S. Air Force in its ALCM competition.

In the storage test, two ALCM engines have been placed in an abandoned munitions storage building at Wright-Patterson AFB, Ohio, for two periods - one will remain for 18 months and the second will be stored for 30 months. During those time periods, no maintenance will be performed on either engine.

To meet Department of Defense requirements, the engine must perform a complete ALCM mission satisfactorily after 30 months without maintenance.

Convair recently shipped engine test assemblies to Wright-Patterson where the engines had been installed in tailcone sections of the competing missiles.

The engines have been placed inside an unheated, earth-covered building in an environment that simulates the type of storage facility that will be used in the field for ALCMs.

Throughout the test period, temperature and relative humidity will be measured and every 90 days the engines will be moved to a flight ramp for simulation of Strategic Air Command alert conditions.

Nautilus, launched Jan. 21, 1954, from Electric Boat's South Yard with Mrs. Dwight Eisenhower as sponsor and a crowd of thousands looking on, went on to confirm Truman's words. From Jan. 17, 1955, when she radioed to an awed world the historic message, "Under way on nuclear power," *Nautilus* went on to shatter records throughout the early part of her career.

Nautilus early captured all records for submerged endurance and speed. During one run from Key West, Fla., to New London, Conn., *Nautilus* averaged a speed in excess of 20 knots, making the voyage completely submerged. Another time, she remained submerged for 265 hours.

The records proved only a prelude to *Nautilus*' most significant achievement -- the historic polar trip in August 1958. *Nautilus* traveled from Hawaii to Europe -- 8,146 miles in 19 days -- passing under the North Pole at 11:15 p.m. EDT on August 3d. She had nosed under the Arctic ice two days earlier. Four days and 1,830 miles later, *Nautilus* surfaced near Greenland, thus opening a new passage between the two major oceans of the world.

The polar trip earned ship's commanding officer, Cmdr. William R. Anderson, the Legion of Merit and the entire crew the Presidential Unit Citation, the first one ever given in peacetime.

In retirement, *Nautilus* will be permanently berthed as an exhibit at the Washington, D.C., Navy Yard.

Digital Mobile Office Cut Over in Texas

A Stromberg-Carlson System Century Digital Mobile Office (DMO) was recently cut over for General Telephone of the Southwest in its Smyer, Tex., exchange.

The 240-line DMO, housed in a 42-by-12-foot trailer, is equipped with Tone Dial service and has capabilities for a number of Stromberg-Carlson's custom calling features including call forwarding, call waiting, three-way calling and speed dialing.

What Others Say . . .

Belgian Air Force Col. Pierre Gouters, Chief of the Belgian F-16 System Management Office, speaking at a press conference on February 8th:

"... The F-16 is an aircraft far superior to any known until now by the (Belgian) air forces, and offers . . . unknown possibilities both in the air and on land . . . It is easy to fly; it has a disconcerting maneuverability which is enough to intimidate any pilot contemplating a counterattack in another aircraft . . ."

GD World

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Manager of Internal Communication
G. Alexander Smith

"It's 7 am..." Hotel Clerks' Nerves Soothed By S-C Reaction

Imagine trying to place 500 telephone calls in five minutes. A hotel desk clerk on the early morning shift might face that unhappy task any day at 6:55 a.m. It's not unusual.

Clerks at the Sheraton Hotel in Maui, Hawaii, were tired of cramped dialing fingers and frazzled nerves in the early morning. The hotel's management came to their aid and called Hawaii Telephone Company with their dilemma: Sheraton's customers required more efficient service, the clerks needed an automatic wake-up system which could be connected to the hotel's present telephone network, and the hotel needed a solution fast.

Sheraton's rooms depend on a Stromberg-Carlson CROSSREED® Private Automatic Branch Exchange (PABX) to distribute telephone calls. Hawaii Telephone Company called Stromberg-Carlson with this question: could an automatic wake-up system be designed, built, shipped and installed in the hotel in 90 days?

Two Stromberg-Carlson design engineers, Rick Swindell and Bob Segal, thought they could do it, and they did. "I guess Bob and I took it on as a challenge," Swindell said. "There are several automatic wake-up systems on the market, but we needed to come up with one that hooked up to Sheraton's CROSSREED switch."

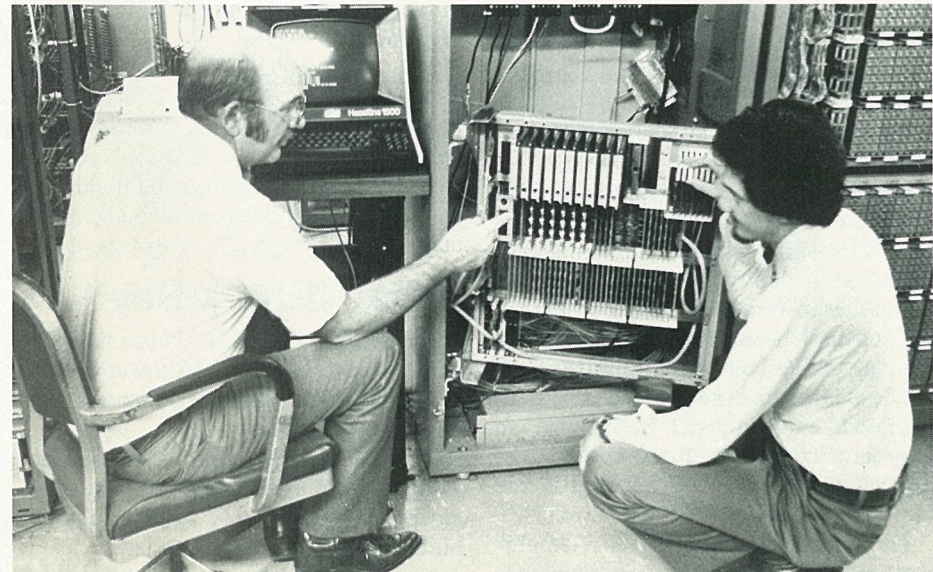
The system that Swindell and Segal developed can function as part of any Stromberg-Carlson CROSSREED 400-, 800- or 1600-line branch exchange. It provides wake-up and appointment reminder recordings for as many as 2,048 hotel/motel rooms; the system's Electronic Message Register also provides an easily-accessible record of all local calls.

The two engineers aimed for a straight forward design; their wake-up system consists of a microprocessor, associated circuitry and a Cathode Ray Tube (CRT) screen. The circuitry is standard, time-tested Stromberg-Carlson equipment with one exception—a customized circuit board, designed by Segal and Swindell to match the microprocessor and CRT components.

There's very little effort required to master their automatic wake-up system. Operators schedule wake-up calls by entering commands on the CRT terminal keyboard.

Then, at 7 a.m. for instance, the system's microprocessor scans its memory, locks in on its list of wake-up requests and 10 guest telephones ring simultaneously. Thirty seconds later, 10 more guests are awakened and greeted by the "good morning, it's 7 o'clock" recording, and so on.

"The system is a snap to operate and a snap to install," Swindell said. "Bob Segal flew out to Hawaii and hooked up the Sheraton's system in three hours."



Wake Up System. Stromberg-Carlson design engineers Rick Swindell (left) and Bob Segal took on the challenge of designing, building and shipping an automatic wake-up system to the Hawaii Telephone Company in 90 days.

Electronics Helps Army Equip Training Center

A team of range instrumentation experts from Electronics Division has spent much of this year at Fort Irwin, Calif., preparing for a demonstration of the division's Range Measuring System (RMS) along with equipment from other companies that could provide a fully instrumented training range for the U.S. Army. Electronics' RMS is expected to compete with other position location systems for instrumenting the U.S. Army's new National Training Center (NTC).

Fort Irwin has been designated the site of the NTC, which will be used by the Army for training exercises year around. The post, located in Mojave Desert, extends from 35 miles north of Barstow to Death Valley and has both desert and mountainous terrain.

Rich Bullock, Electronics' project manager at Fort Irwin, says the demonstration will use Electronics' RMS system, Xerox's Multiple Integrated Laser Engagement Simulator and a central display built by Science Applications, Inc. of La Jolla, Calif., all of which combine to provide a realistic battlefield simulation.

"Players" in the demonstration will be equipped with laser gun simulators and receptors linked to the RMS scoring system. Each simulator has the characteristics of the weapon with which it is paired. A tank gun laser, for example, will fire only as fast as the actual gun, and projectiles are timed at their actual rate of flight. The receptors on target vehicles and personnel indicate when a hit has been made by the laser and provide the exercise monitors with an immediate record of kills for both equipment and personnel.

The Electronics Division system being demonstrated at Fort Irwin has the capability of tracking hundreds of individuals or ground and air vehicles simultaneously and, by using time-coded entries into the computer, can show hits, misses and kills from every shot fired by the laser.

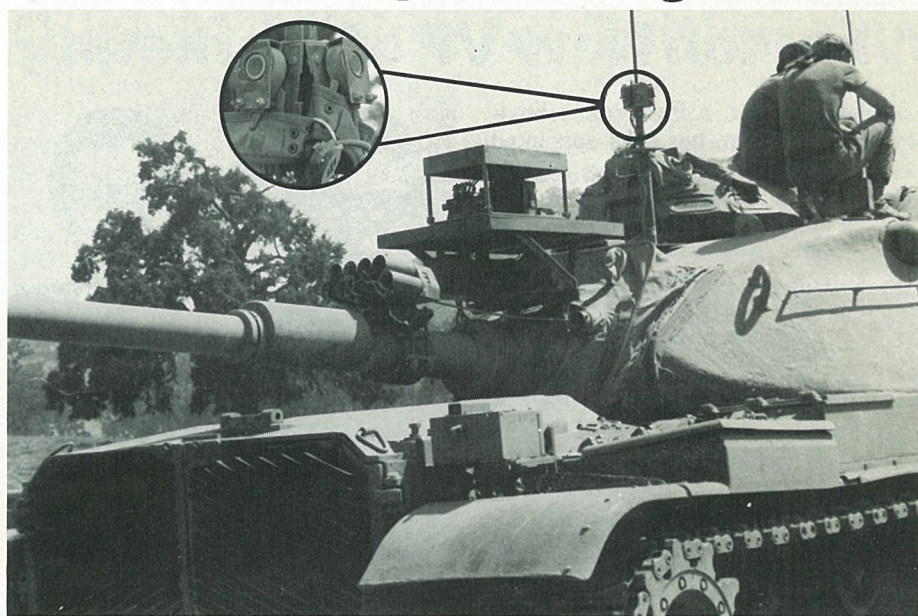
As in other Electronics' RMS systems, the data coming to the central computers is recorded and can be replayed for critique and analysis. Army officials plan for a unit commander to go home from an NTC exercise with a package of video and audio tapes that duplicate all training scenarios and which can be used for improving unit training at home station.

DatagraphiX to Sell Units to Recover Silver from Film

DatagraphiX announced that it is marketing the Ultra line of silver recovery and solution management systems manufactured by Snook/Rotex Corp.

According to Rene Gallet, National Supplies Manager, the Ultra systems feature automatic power control, easy hookup to automatic processors, maximum recovery efficiency and easy silver removal.

"Utilizing the Ultra silver recovery system makes the process a very economical one, especially in light of today's silver prices," Gallet said.



Training by Laser. Tanks participating in the U.S. Army's National Training Center exercises will be equipped with laser transmitters that will be used to simulate weapons firing. A receptor (inset) will be used to score hits on the vehicles. Both the transmitters and the receptors are linked to the Electronics Division's Range Measuring System to simulate battle conditions.

between scheduled trips to the center.

The system being demonstrated at Fort Irwin is mounted only on ground vehicles—tanks, jeeps and personnel carriers.

When fully operational, every Army combat battalion in the continental United States will rotate through the NTC every 18 months, receiving training that could not be duplicated at home bases.

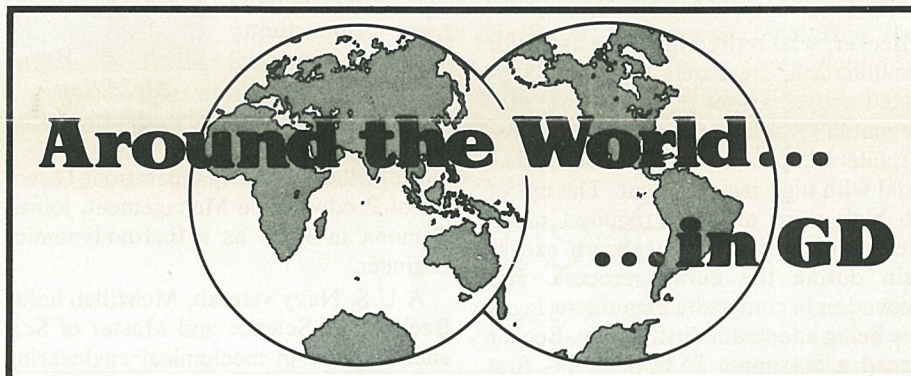
As presently envisioned, a typical battalion would be airlifted to Fort Irwin from its deployment airfield, immediately draw its equipment from prepositioned stocks and head for the field, either to the live fire range in the northern portion of the center, or to the instrumented range in the south.

For the next two weeks, the unit would

live in the field, following battle scenarios on the range. These battles last from 18-36 hours, and with the instant replay capability, the After Action Reports would be made to the commanders within hours of the end of an exercise. The commander could then choose between repeating the scenario or going on to another.

At the end of the first week, a unit on the engagement simulation range would redeploy to the live fire range, changing places with a sister unit from the same brigade.

When the two-week training period is completed, the brigade would be flown back to its home base, while another brigade enters training.



CHQ: Richard A. Bowhay was promoted to Manager of Corporate Purchasing... Susan E. Dong transferred from Electronics as Corporate Manager of Business Planning—Commercial & Resources... George E. Rettig was promoted to Internal Audit Manager—EDP... Lloyd G. Barnd joined as Corporate Graphics Specialist... Diane L. Mossler was promoted to Legislative Affairs Assistant in Washington... James T. Wilson joined as Corporate Office Services Supervisor... Vito M. Sardo has been named Senior EDP Audit Administrative Specialist based in San Diego.

Fort Worth: Donald M. Tye transferred from St. Louis as Project Manager... Richard E. Briggs was promoted to Fabrication Manager... John B. Herd Jr. was promoted to Manager, Support Equipment & Tool Control.

ATC: William C. Massey was promoted to Director of Operations.

Convair: Richard H. Taddiken was promoted to Manager—Estimating.

Pomona: George E. VanVeldhoven joined as Design Specialist... J. Patrick Rimer transferred from St. Louis as Assistant to the Vice President—Marketing... Tish-Chun Chang joined as Engineering Specialist... Holman L. Anderson was promoted to Chief—Inspection... John Lombardi was promoted to Quality Assurance Project Engineer... Wilton H. Power and Mark R. Seldon were promoted to Manager—Estimating... Norm D. Barton has been appointed Assistant Director of Navy Marketing for Moderate Range Tactical Systems.

Stromberg-Carlson: John W. Bull joined as Manager—Public Network Planning... Edward A. Cartwright joined as Principal Engineer... Enrique G. Comas was promoted to Supervisor Engineering Group I... Larry C. Cornwell joined as Director—Marketing Communications... Arthur R. Eastwood and Thomas L. Goulding were promoted to Manager—Engineering... Walter R. O'Connell joined as Marketing Sales Support Manager... V. A. Twaddell transferred from Pomona as Principal Engineer.

Electric Boat: Dale R. Banks was promoted to Chief—Cost Engineering... Elaine S. Briggs was promoted to Supervisor—Industrial Hygiene... Gary W. LaValley was promoted to Engineering Manager... Barry W. Pasqualini was promoted to Superintendent... Petros T. Petrides was promoted to Principal Engineer.

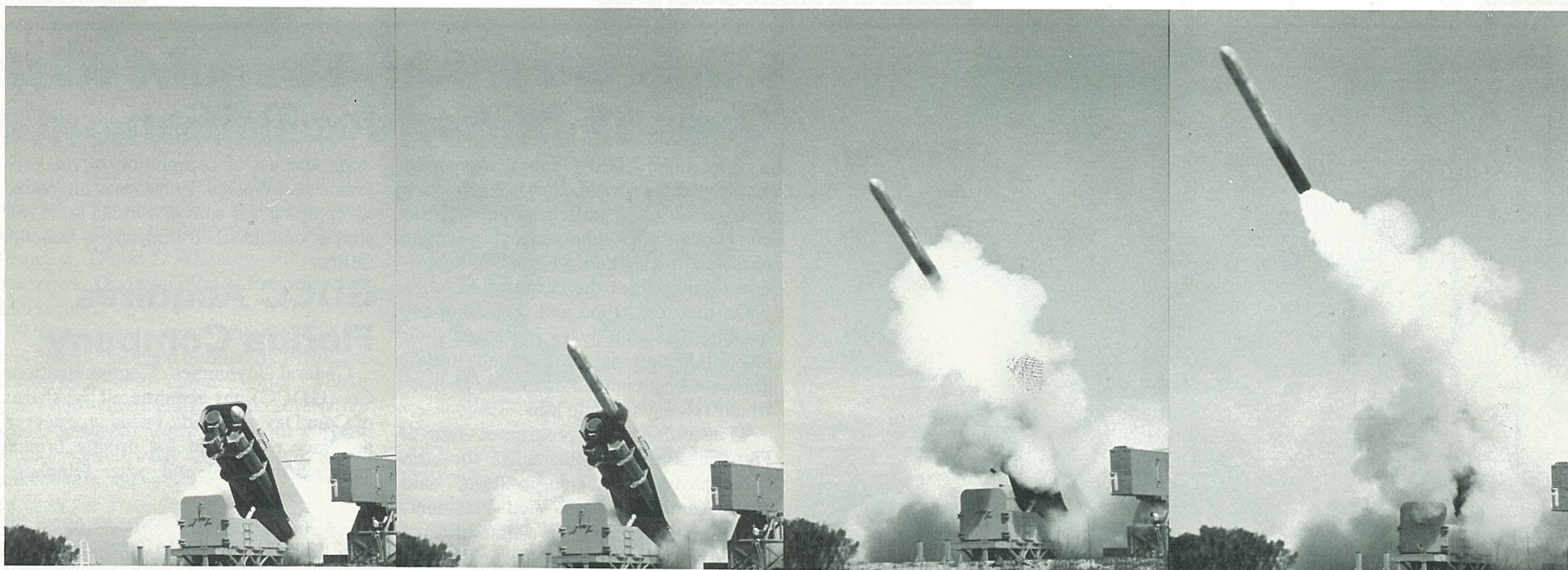
DSS: Calvin L. Massey was promoted to Manager—DSS DatagraphiX... James A. Blanchard was named Manager—Purchasing & Material.

Quincy Shipbuilding: Robert A. Babcock was promoted to Project Control Chief.

Electronics: Walter P. Robertson was promoted to Director—Product Support.

Freeman United: Kim C. Bingham was promoted to Assistant Superintendent—Fidelity Mine.

GDCC: Brij M. Lal was promoted to Proposal Engineering Manager... Terry I. Phillips was promoted to Systems Development Director.



A Tomahawk cruise missile emerges from the armored box launcher at Point Mugu, Calif.

Cruise Missile Fired from ABL At Point Mugu

The first firing of a U.S. Navy/General Dynamics Tomahawk cruise missile from an armored box launcher (ABL) was successfully made from the Pacific Missile Test Center at Point Mugu, Calif., on March 13th.

The test firing was a major step in validating the ABL concept in preparation for the first shipboard firing of a Tomahawk from an operational destroyer.

In the test, the armor-plated, four-tube launcher was mounted on the ground at the test center to simulate a shipboard launch. Following the successful firing, the missile carried out an antiship mission on the Sea Test Range off the coast of southern California. The flight was the 49th for a Tomahawk missile.

After completion of the test flight, the missile was recovered on land at San Clemente Island and will be used again in the Tomahawk test program.

In shipboard use, the Convair-built launcher will be deck-mounted and will store four fully fueled and armed missiles secured and ready for firing. Planning calls for the launcher system to be installed on selected U.S. Navy destroyers and cruisers.

Two ABLs have been built to date: the first was the system used in the Point Mugu test; the other has been installed on the destroyer USS *Merrill* (DD 976) and will be used for the first firing at sea.

Two Submarines Slated for Launch At Groton in April

Electric Boat Division will mark the month of April 1980 by launching two submarines within a period of eight days.

On April 19th, the *Boston* (SSN 703), a 688-class fast-attack submarine, will slide into the Thames River at Groton, and one week later, on April 26th, the division will launch the second Trident ballistic missile submarine, the *Michigan* (SSBN 727).

The *Boston* will be the 11th 688-class ship to be launched at Electric Boat and will join five others undergoing final outfitting and testing at the shipyard after launch. The division has already delivered five of the advanced, high-speed submarines to the U.S. fleet.

The 360-foot-long, 6,900-ton attack submarines are designed and equipped to hunt down and destroy enemy ships. They are manned by a crew of 12 officers and 115 enlisted men.

The Trident submarines, 560 feet long and displacing about 18,750 tons, are the largest submarines ever built. Manned by a 154-man crew, each Trident will carry 24 advanced, long-range ballistic missiles. The first Trident, the *Ohio* (SSBN 726), was launched at Groton on April 7, 1979.

Seven Tridents are currently under construction at Electric Boat. Eight other 688-class ships are in various stages of production at the shipyard prior to launch.

GD World

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Pomona Awarded \$21 Million Contract On Antitank Weapon

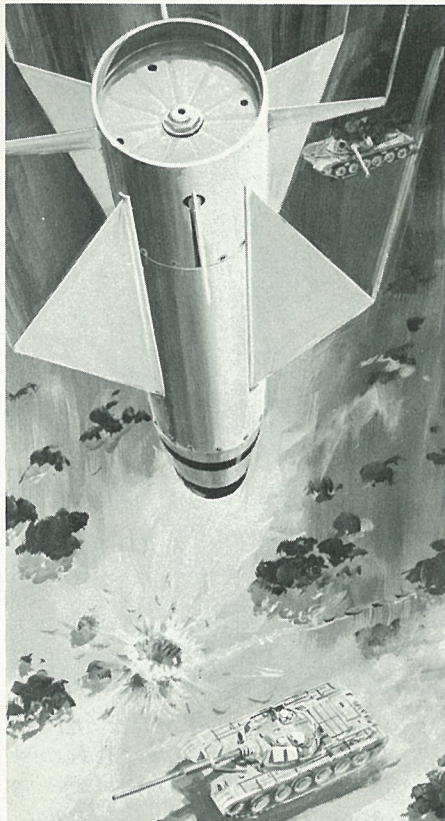
The U.S. Army Missile Command (MICOM) has awarded Pomona Division a \$20.9 million contract to provide infrared terminally guided submissiles for the flight demonstration phase of the Assault Breaker program.

The Assault Breaker program is a new antiarmor warfare concept which uses precision guided submissiles. The terminally guided submissiles will be carried in a larger missile, which will be launched and guided to a general target area. A dispenser on the larger missile will then deploy the submissiles against enemy armor.

Under terms of the contract, the General Dynamics-developed submissiles will demonstrate their inflight capability to be launched from the carrier missile, autonomously acquire targets and guide themselves to impact. In addition, the tests will demonstrate the successful integration of Assault Breaker's system elements.

In a recent test, a Pomona-designed submissile was released from a helicopter and scored a direct hit on a tank, demonstrating the feasibility of autonomous inflight acquisition of a target by a submissile and subsequent homing guidance to impact.

The infrared seeker used in the submissiles is based on the seeker used in Stinger, a shoulder-fired antiaircraft weapon now in production at the Pomona Division for the Army.



An Artist's Concept of Assault Breaker



Minister's Visit. D. James Killen, Australian Minister for Defence, is briefed on the cockpit of an F-16 by GD Test Pilot Jim McKinney (right) during the minister's recent visit to Fort Worth Division. The F-16 is one of two finalists in Australia's competition for a new tactical fighter for the Royal Australian Air Force.

Australia's Defence Minister Inspects F-16 at Fort Worth

D. James Killen, the Minister for Defence of Australia, toured the F-16 assembly line and climbed into the cockpit of the advanced Mach 2-plus fighter during a visit to Fort Worth Division on February 28th.

The F-16 is one of two finalist aircraft in Australia's competition to select a new tactical fighter for the Royal Australian Air Force (RAAF).

Killen visited the home of the F-16 fighter while in the United States to attend the 29th annual meeting of the ANZUS Council. The ANZUS partnership joins Australia, New Zealand and the United States in a common effort for defense in the Pacific.

During his visit to Fort Worth's mile-long aircraft manufacturing facility, Killen and his party viewed work under way on more than 100 F-16 multimission fighters for the U.S. and Israeli air forces. Killen also examined F-16 structural components which are candidates for manufacture by Australian industry. Components of F-16s for the Belgian, Danish, Dutch

and Norwegian air forces are produced in Fort Worth as well as in Europe, with final assembly of those aircraft on production lines in Belgium and the Netherlands. If Australia selects the F-16, Government Aircraft Factories would assemble the RAAF's fighters at its facility near Melbourne.

Before departing the General Dynamics complex, which also produced Australia's F-111C fighter-bombers, Killen and his party witnessed an F-16 flight demonstration by Chief F-16 Test Pilot Neil R. Anderson. The General Dynamics test pilot began the flight program with a short take-off and a maximum power vertical climb to demonstrate the F-16's high thrust-to-weight ratio.

Accompanying Killen on the tour of the F-16 manufacturing plant were Donald E. Eltringham, Deputy Secretary for Defence; Australian Air Vice Marshal David Evans, Chief of Air Force Operations, and Wing Commander Douglas Edwards, Assistant Air Attache at the Australian Embassy in Washington, D.C.

Quincy to Name 9th LNG Tanker

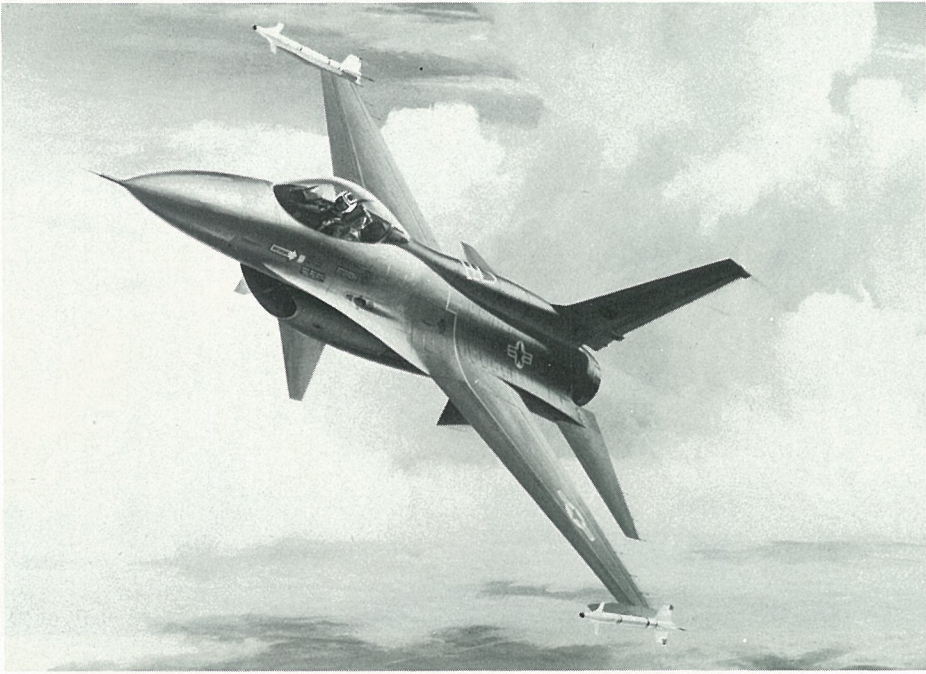
Quincy Shipbuilding Division's ninth liquefied natural gas tanker will be named *LNG Lake Charles* during ceremonies April 18th at the shipyard.

Richard L. O'Shields, Chairman and Chief Executive Officer of Panhandle Eastern Pipe Line Co., will deliver the principal address at the 5:30 p.m. ceremonies. His wife, Shirley, will sponsor the 936-foot, 95,000-ton vessel.

Other officials participating in the ceremonies include David S. Lewis, General

Dynamics' Chairman and Chief Executive Officer; P. Takis Veliotis, Executive Vice President - Marine for General Dynamics, and Joseph H. Lennox, Quincy Shipbuilding General Manager.

LNG Lake Charles and a sister ship, both scheduled for delivery later this year, will transport liquefied natural gas from Algeria to Lake Charles, La. Seven other sister ships, all built at Quincy, are carrying liquefied natural gas from Indonesia to Japan.



An Artist's Concept of an AFTI/F-16

Air Force F-16 Being Converted To Fighter Technology Test Bed

The U.S. Air Force has delivered to Fort Worth Division an F-16 fighter which will be used as a test bed for the development and flight demonstration of new fighter aircraft technologies under the Advanced Fighter Technology Integration (AFTI/F-16) Program.

The AFTI/F-16 Program is directed by the Air Force Systems Command's Flight Dynamics Laboratory at Wright-Patterson AFB, Ohio. General Dynamics was awarded a \$34.3 million prime contract for the program in December 1978.

In ceremonies March 6th on the Fort Worth flight line, General Dynamics AFTI/F-16 Program Manager Max Wadouds accepted the developmental F-16 fighter from Col. Robert C. Barlow, Director of the Flight Dynamics Laboratory, and Lt. Col. Arthur J. Bianco, AFTI/F-16 Program Manager. The former AFTI/F-16 Program Manager, Col. Ernest F. Moore, also was present for the important milestone.

The AFTI demonstration aircraft will be modified extensively at Fort Worth to incorporate new aerodynamic and control technologies. It is scheduled to begin a flight test program at Edwards AFB, Calif., in July 1981.

"The sole purpose of the AFTI/F-16 Program is to develop and evaluate promising technologies to provide future tactical fighter options," said Col. Bianco.

New technologies scheduled to be developed during the program include

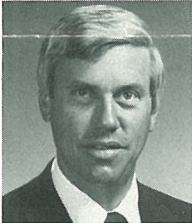
advanced maneuvering capability, digital flight controls, an integrated flight and weapons fire control system and pilot-aircraft interface improvements.

Information generated by the AFTI/F-16 Program will be made available to the U.S. aircraft industry so that the newly proven technologies may be applied in the design of future generations of fighter aircraft.

Carlson Promoted To Management Development Post

Donald M. Carlson, formerly Director of Industrial Relations at Pomona, has been appointed Corporate Director of Executive Development in St. Louis.

He has responsibility for the training and development of General Dynamics management personnel throughout the corporation.



Carlson

Carlson joined General Dynamics in 1959 as a technical aide at Electric Boat Division in Groton, Conn., and served for 11 years in a variety of increasingly responsible management positions. He also served in personnel management at the Electro Dynamic facility in Avenel, N.J., and at corporate headquarters.

He attended the U.S. Coast Guard Academy and received his Bachelor of Science degree in education and psychology from Western Michigan University in 1959 and his Master of Business Administration degree from the University of Connecticut in 1965.

John Kane Appointed GD's Liaison to NAB

John C. Kane, GD Corporate Director of Administration, has been selected as a corporate liaison to the National Alliance of Businessmen (NAB).

Kane, along with representatives from other large corporations, will give advice and help in planning NAB programs which find jobs for the unemployed.

At a meeting of the corporate liaisons held in Washington, D.C., NAB Chairman John H. Filer, Chairman of Aetna Life & Casualty, said, "If public problems are not solved (with the help of private enterprise), we will not have an environment in which our businesses have hope of being successful and profitable in the future."

Filer warned that "one of the greatest threats to the successful continuance of the private enterprise system is the existence of public social problems that have not been solved."

The NAB is an independent, nonprofit corporation which works in partnership with government, labor, education and business groups to reduce unemployment.

GD Employees Received Over \$1 Million for Tuition

More than 2,000 General Dynamics employees from coast to coast took courses at local colleges, universities and vocational schools last year and received more than \$1 million in tuition refunds from the corporation.

On their own time and with company backing, the employees increased their job qualifications or pursued undergraduate or advanced academic degrees which related to their jobs.

"The tuition refund program at General Dynamics makes good sense for both the employee and the corporation," said Arch Rambeau, Staff Vice President, Personnel Relations. "In a time of rapid technological development, employees need to insure their skills and expertise do not fall behind and become obsolete. For the corporation, the program means insuring that in-house talent is current with the latest developments in a variety of fields."

Under the tuition refund program, in 1979 the corporation paid out \$1,162,331 for tuition costs of 2,327 employees who attended accredited colleges or universities or approved vocational schools. Courses of study eligible for the refund are limited to work-related subjects or degrees, and the refund is dependent

upon successful completion of the program requirements. Employees interested in applying for tuition refund for 1980 should contact their Employee Benefits Office.

GDCC Acquires Florida Company

General Dynamics Communications Co. (GDCC) has acquired all the shares of Com Dev, a Florida-based producer of auxiliary equipment for private branch exchanges (PBX) and other telephone related systems.

Com Dev currently employs about 80 persons and is located in Sarasota, Fla. It was founded in 1974 and had sales of approximately \$3 million last year.

F-16s Scheduled For Europe in 1981

The U.S. Air Force will begin basing F-16 squadrons in West Germany by mid-1981, according to the Department of Defense.

Three squadrons of F-16s will be deployed to Hahn AB, West Germany, to replace aging F-4B Phantoms. About 72 F-16 multimission fighters will be stationed at Hahn.

General Dynamics EEO Commitment

Equal Employment Opportunity continues to be an important and integral part of our management philosophy at General Dynamics. We recruit, hire, train and promote persons in all job classifications without regard to race, color, religion, sex, age or national origin and base decisions on employment so as to further the principle of Equal Employment Opportunity. We will discharge, as well, our obligations with respect to the handicapped and veterans. It is our job to insure that all personnel actions will be executed and administered on that basis.

As a result of our policy and practice of according Equal Employment Opportunities to all, we have made significant progress in increasing the representation of minority groups and women at all levels throughout the company. We must continue our commitments to Affirmative Action at every General Dynamics' operation and facility and see to it that equal opportunity exists in fact as well as in policy. I am committed, and I expect all members of our management team to be similarly committed.

D.S. Lewis

David S. Lewis
Chairman

6 GD Operations Win Safety Award

Six General Dynamics divisions, subsidiaries and facilities earned the Chairman's Award for Excellence in Safety Performance for 1979.

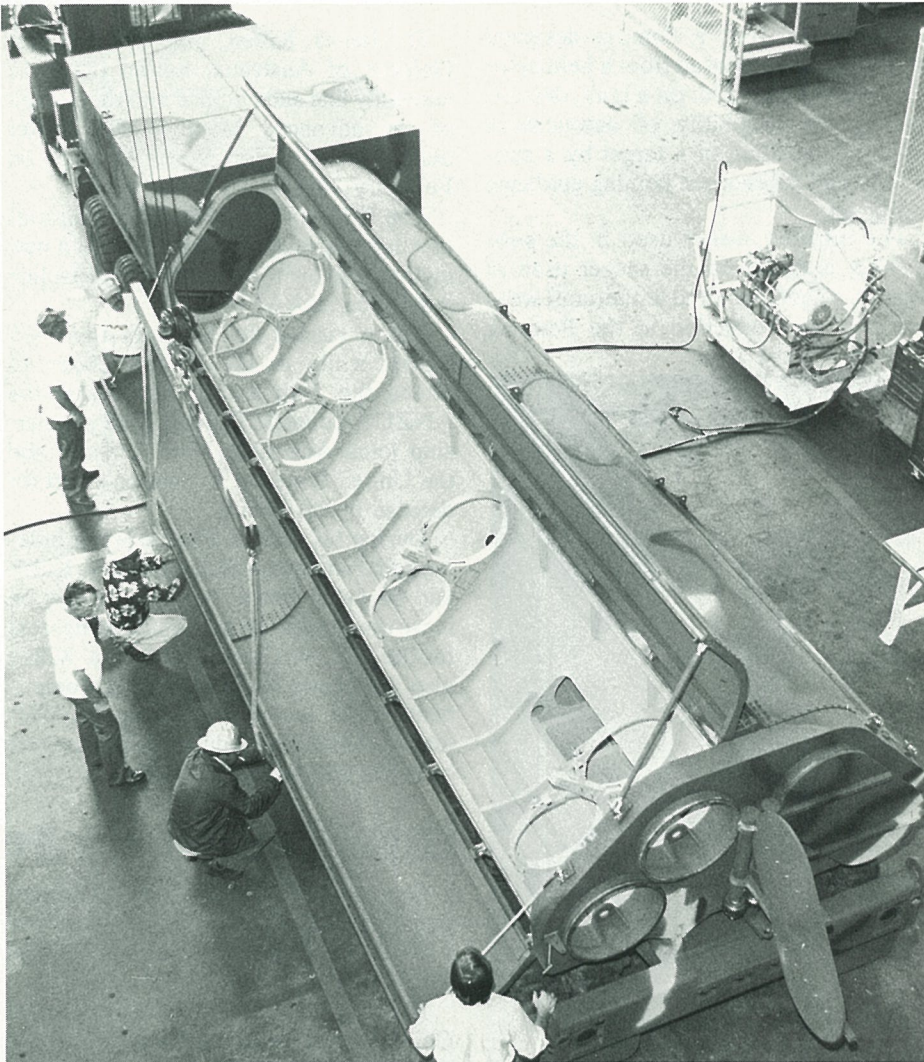
Convair, DatagraphiX, Electronics, Fort Worth, Marblehead Lime and the Charleston facility of Quincy Shipbuilding have compiled safety records which were substantially better than the average for their industries and conducted active and comprehensive loss control programs which met or exceeded corporate standards for the year.

On a corporate-wide basis, lost workday and recordable injury incidence rates were, respectively, 39 percent and 22 percent better than weighted averages for the industries in which GD is engaged.

Savings And Stock Investment Values

The General Dynamics Savings and Stock Investment Plan unit values at the end of January were as follows:

Salaried:	
Government Bonds	\$ 2.3043
Diversified Portfolio	1.7329
Fixed Income	1.0559
Hourly:	
Government Bonds	2.3036
Diversified Portfolio	1.7688
General Dynamics Stock	80.38



Making Ready. Convair technicians install the final access door on the first test transporter-erector-launcher (TEL) for the U.S. Air Force's ground-launched cruise missile. The TEL carries four Tomahawk cruise missiles and will be used this spring for a live firing test. General Dynamics is the prime contractor for the ground-launched cruise missile.

Starr Named F-16/79 Director; Wheaton New VP of Marketing

Sterling V. Starr, a Fort Worth Division Vice President, has been appointed Director of the F-16/79 Export Fighter Program. David J. Wheaton will replace Starr as Division Vice President of Marketing.

The proposed export fighter, or F-X as it is called, has been defined by President Carter as an intermediate fighter "whose cost and performance characteristics would generally lie between our current export fighter, the F-5E, and fighter aircraft now in production for U.S. forces, such as the F-16."

General Dynamics' design for the export fighter, the F-16/79, combines the basic F-16 multimission fighter airframe and equipment with an 18,000-pound-thrust General Electric J79 turbojet engine. The standard F-16 uses a 25,000-pound-thrust Pratt & Whitney F100 turbofan engine. The F-16/79 would weigh somewhat more than the standard F-16 and would have a shorter combat range, but it features lower acquisition cost, early availability and low-risk development for countries seeking an advanced fighter.

Starr, 49, is a veteran of 27 years with General Dynamics. He joined Convair



Starr



Wheaton

Division in 1953 as a dynamics engineer and moved to corporate headquarters in 1970 where he served as Staff Vice President-Corporate Planning. In 1976, he transferred to Fort Worth as Vice President-Marketing. He is a native of Alliance, Ohio, and was graduated from Ohio State University in 1953 with Bachelor of Science and Master of Science degrees in aeronautical engineering.

Wheaton, 39, was formerly Director of F-16 Marketing. He has 13 years of engineering and marketing experience with Convair and Fort Worth divisions and 14 years of active and reserve experience as a pilot in the U.S. Navy. A native of Las Vegas, N. M., Wheaton was graduated from the University of Colorado in 1962 with a Bachelor of Science degree in aeronautical engineering.

Employees Honored For Suggestions By National Group

Fort Worth's Clyde W. Becker and Carol J. Kafer have received citations from the National Association of Suggestion Systems for their suggestions which led to cost savings for the division in 1979.

Becker, who retired last year as senior manufacturing research engineer, suggested use of a low resin content, pre-pregnated graphite/epoxy material for graphite composite parts instead of material with high resin content. The use of the high resin material required many plies of bleeder cloth to absorb excess resin during the curing process. His innovation in composite manufacturing is now being adopted industry wide. Becker earned a maximum \$5,000 for his first year savings of \$819,696.

Kafer, an electrical harness assembler, suggested the vendor of electrical wafer plugs leave the thermo-plastic sealing ring off the plug terminals and put them instead in the solder sleeve. In addition to saving labor costs in the assembling of electrical harnesses, it also allowed the vendor to replace a hand operation, installing sealing rings on plug terminals, with a machine operation, installing sealing rings in solder sleeves; the vendor reduced his price accordingly. First year savings were \$343,488; Kafer also earned the maximum award of \$5,000.

Last year, 1,372 employees of the Fort Worth Division earned \$191,445 for their suggestions, which produced first year savings totaling \$4,243,416 for the division.

Cushman Dow Elected President San Diego Chamber of Commerce

Convair General Counsel H. Cushman Dow has been elected President of the San Diego Chamber of Commerce.

Dow, who had been the chamber's

First Vice President, will head the 2,500-member group for one year and represent the San Diego business community. He also is a member of the Board of Directors and serves on the chamber's Executive Committee.

Dow has been Convair's General Counsel since joining General Dynamics in 1962. He holds a Bachelor of Arts degree from Yale University and a Bachelor of Law degree from Harvard University. He is a member of the American Bar Association, the Federal Bar Association, the San Diego County Bar Association, the California Manufacturers Association and the World Affairs Council.

McMillan Named Head of IR at Pomona

Larry McMillan has been named Director of Industrial Relations at Pomona.

As Director of Industrial Relations, McMillan assumes responsibilities for educational services, employment, security, equal employment opportunity programs, medical services, employee services, wage and salary administration and labor relations.

McMillan, formerly Operations Director of Product Line Management, joined Pomona in 1960 as a thermodynamics engineer.

A U.S. Navy veteran, McMillan holds Bachelor of Science and Master of Science degrees in mechanical engineering from the University of Southern California.

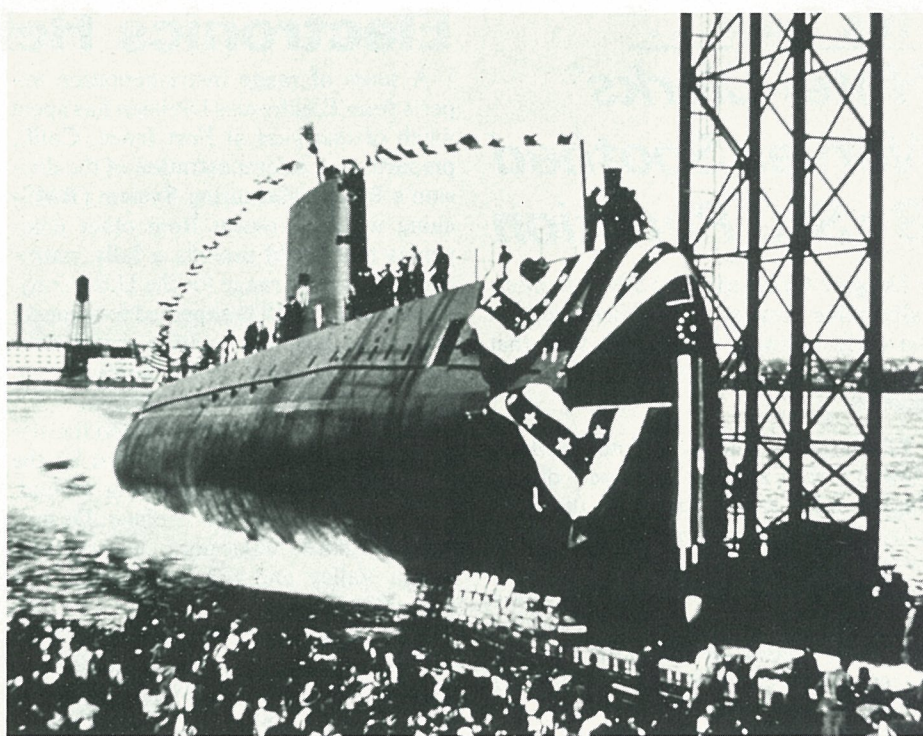


McMillan

F-16 Night System Proposals Sought

The U.S. Air Force has issued a Request for Proposal for development of a night attack system for single-seat F-16 and A-10 aircraft.

The Air Force Systems Command's Aeronautical Systems Division at Wright-Patterson AFB, Ohio, will develop the Low Altitude Navigation Targeting Infrared for Night (LANTIRN) system which will give the tactical air forces an improved capability to acquire, track and destroy ground targets at night with single-place aircraft.



The Nautilus Launching, Jan. 21, 1954

History-Making Career Ends For First Nuclear Sub, Nautilus

The grand old lady of the U.S. Navy's nuclear submarine fleet, USS *Nautilus* (SSN 571), officially retired earlier this month, ending a 25-year career that ushered in a new era of technology and made the pages of Jules Verne come alive.

The Electric Boat Division-built vessel, the first nuclear-powered ship in the world, was decommissioned at Mare Island Naval Shipyard in California, sparking memories for many on hand for the ceremonies.

The story of the *Nautilus* is closely tied to Electric Boat. The keel for the 320-foot vessel was laid at Groton on June 14, 1952, by President Harry Truman.

"The day the propellers of this 'submarine first bite into the water,' President Truman said in his address that day, "... will be the most momentous day in the field of atomic science since that first flash of light down in the desert seven years ago. Then we knew we had a bomb for war. Now we will have a working power plant for peace."

ALCM Engines In Long-Term Storage Test

The U.S. Air Force has begun an unusual 30-month storage test of two air-launched cruise missile (ALCM) maintenance-free engines.

The F107 engines, built by Williams Research Corp., of Walled Lake, Mich., are used on the Convair-built AGM-109 cruise missile and the Boeing AGM-86. The missiles are currently being evaluated by the U.S. Air Force in its ALCM competition.

In the storage test, two ALCM engines have been placed in an abandoned munitions storage building at Wright-Patterson AFB, Ohio, for two periods - one will remain for 18 months and the second will be stored for 30 months. During those time periods, no maintenance will be performed on either engine.

To meet Department of Defense requirements, the engine must perform a complete ALCM mission satisfactorily after 30 months without maintenance.

Convair recently shipped engine test assemblies to Wright-Patterson where the engines had been installed in tailcone sections of the competing missiles.

The engines have been placed inside an unheated, earth-covered building in an environment that simulates the type of storage facility that will be used in the field for ALCMs.

Throughout the test period, temperature and relative humidity will be measured and every 90 days the engines will be moved to a flight ramp for simulation of Strategic Air Command alert conditions.

Nautilus, launched Jan. 21, 1954, from Electric Boat's South Yard with Mrs. Dwight Eisenhower as sponsor and a crowd of thousands looking on, went on to confirm Truman's words. From Jan. 17, 1955, when she radioed to an awed world the historic message, "Under way on nuclear power," *Nautilus* went on to shatter records throughout the early part of her career.

Nautilus early captured all records for submerged endurance and speed. During one run from Key West, Fla., to New London, Conn., *Nautilus* averaged a speed in excess of 20 knots, making the voyage completely submerged. Another time, she remained submerged for 265 hours.

The records proved only a prelude to *Nautilus*' most significant achievement -- the historic polar trip in August 1958. *Nautilus* traveled from Hawaii to Europe -- 8,146 miles in 19 days -- passing under the North Pole at 11:15 p.m. EDT on August 3d. She had nosed under the Arctic ice two days earlier. Four days and 1,830 miles later, *Nautilus* surfaced near Greenland, thus opening a new passage between the two major oceans of the world.

The polar trip earned ship's commanding officer, Cmdr. William R. Anderson, the Legion of Merit and the entire crew the Presidential Unit Citation, the first one ever given in peacetime.

In retirement, *Nautilus* will be permanently berthed as an exhibit at the Washington, D.C., Navy Yard.

Digital Mobile Office Cut Over in Texas

A Stromberg-Carlson System Century Digital Mobile Office (DMO) was recently cut over for General Telephone of the Southwest in its Smyer, Tex., exchange.

The 240-line DMO, housed in a 42-by-12-foot trailer, is equipped with Tone Dial service and has capabilities for a number of Stromberg-Carlson's custom calling features including call forwarding, call waiting, three-way calling and speed dialing.

What Others Say . . .

Belgian Air Force Col. Pierre Gouters, Chief of the Belgian F-16 System Management Office, speaking at a press conference on February 8th:

"... The F-16 is an aircraft far superior to any known until now by the (Belgian) air forces, and offers . . . unknown possibilities both in the air and on land . . . It is easy to fly; it has a disconcerting maneuverability which is enough to intimidate any pilot contemplating a counterattack in another aircraft . . ."

GD World

Published by
General Dynamics Corporation
Pierre Laclede Center, St. Louis, Mo. 63105
Manager of Internal Communication
G. Alexander Smith

"It's 7 am..." Hotel Clerks' Nerves Soothed By S-C Reaction

Imagine trying to place 500 telephone calls in five minutes. A hotel desk clerk on the early morning shift might face that unhappy task any day at 6:55 a.m. It's not unusual.

Clerks at the Sheraton Hotel in Maui, Hawaii, were tired of cramped dialing fingers and frazzled nerves in the early morning. The hotel's management came to their aid and called Hawaii Telephone Company with their dilemma: Sheraton's customers required more efficient service, the clerks needed an automatic wake-up system which could be connected to the hotel's present telephone network, and the hotel needed a solution fast.

Sheraton's rooms depend on a Stromberg-Carlson CROSSREED® Private Automatic Branch Exchange (PABX) to distribute telephone calls. Hawaii Telephone Company called Stromberg-Carlson with this question: could an automatic wake-up system be designed, built, shipped and installed in the hotel in 90 days?

Two Stromberg-Carlson design engineers, Rick Swindell and Bob Segal, thought they could do it, and they did. "I guess Bob and I took it on as a challenge," Swindell said. "There are several automatic wake-up systems on the market, but we needed to come up with one that hooked up to Sheraton's CROSSREED switch."

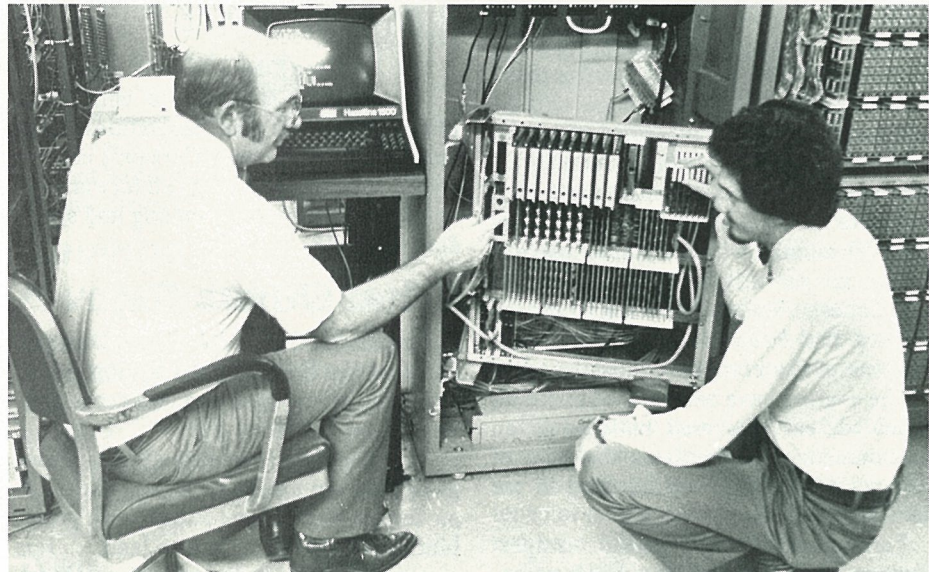
The system that Swindell and Segal developed can function as part of any Stromberg-Carlson CROSSREED 400-, 800- or 1600-line branch exchange. It provides wake-up and appointment reminder recordings for as many as 2,048 hotel/motel rooms; the system's Electronic Message Register also provides an easily-accessible record of all local calls.

The two engineers aimed for a straight forward design; their wake-up system consists of a microprocessor, associated circuitry and a Cathode Ray Tube (CRT) screen. The circuitry is standard, time-tested Stromberg-Carlson equipment with one exception—a customized circuit board, designed by Segal and Swindell to match the microprocessor and CRT components.

There's very little effort required to master their automatic wake-up system. Operators schedule wake-up calls by entering commands on the CRT terminal keyboard.

Then, at 7 a.m. for instance, the system's microprocessor scans its memory, locks in on its list of wake-up requests and 10 guest telephones ring simultaneously. Thirty seconds later, 10 more guests are awakened and greeted by the "good morning, it's 7 o'clock" recording, and so on.

"The system is a snap to operate and a snap to install," Swindell said. "Bob Segal flew out to Hawaii and hooked up the Sheraton's system in three hours."



Wake Up System. Stromberg-Carlson design engineers Rick Swindell (left) and Bob Segal took on the challenge of designing, building and shipping an automatic wake-up system to the Hawaii Telephone Company in 90 days.

Electronics Helps Army Equip Training Center

A team of range instrumentation experts from Electronics Division has spent much of this year at Fort Irwin, Calif., preparing for a demonstration of the division's Range Measuring System (RMS) along with equipment from other companies that could provide a fully instrumented training range for the U.S. Army. Electronics' RMS is expected to compete with other position location systems for instrumenting the U.S. Army's new National Training Center (NTC).

Fort Irwin has been designated the site of the NTC, which will be used by the Army for training exercises year around. The post, located in Mojave Desert, extends from 35 miles north of Barstow to Death Valley and has both desert and mountainous terrain.

Rich Bullock, Electronics' project manager at Fort Irwin, says the demonstration will use Electronics' RMS system, Xerox's Multiple Integrated Laser Engagement Simulator and a central display built by Science Applications, Inc. of La Jolla, Calif., all of which combine to provide a realistic battlefield simulation.

"Players" in the demonstration will be equipped with laser gun simulators and receptors linked to the RMS scoring system. Each simulator has the characteristics of the weapon with which it is paired. A tank gun laser, for example, will fire only as fast as the actual gun, and projectiles are timed at their actual rate of flight. The receptors on target vehicles and personnel indicate when a hit has been made by the laser and provide the exercise monitors with an immediate record of kills for both equipment and personnel.

The Electronics Division system being demonstrated at Fort Irwin has the capability of tracking hundreds of individuals or ground and air vehicles simultaneously and, by using time-coded entries into the computer, can show hits, misses and kills from every shot fired by the laser.

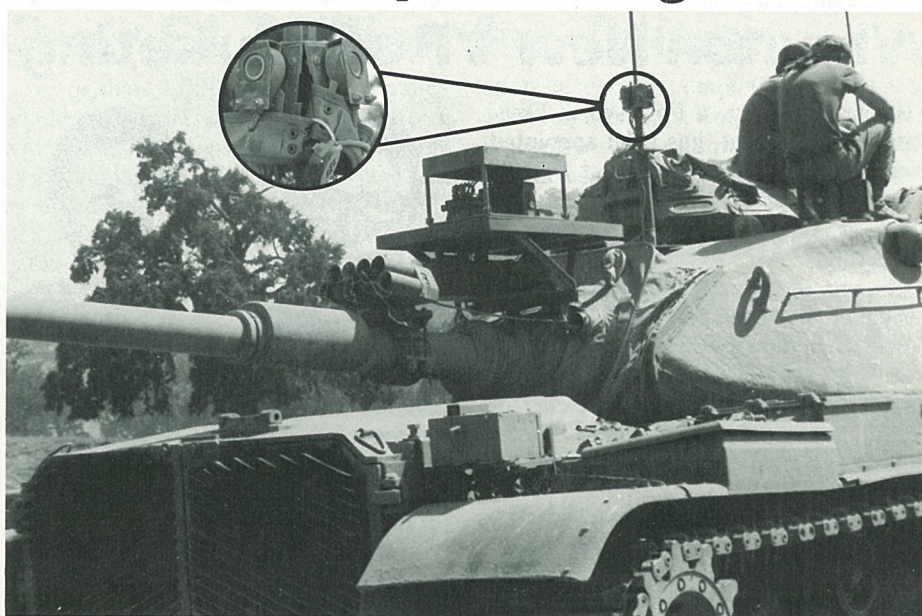
As in other Electronics' RMS systems, the data coming to the central computers is recorded and can be replayed for critique and analysis. Army officials plan for a unit commander to go home from an NTC exercise with a package of video and audio tapes that duplicate all training scenarios and which can be used for improving unit training at home station.

DatagraphiX to Sell Units to Recover Silver from Film

DatagraphiX announced that it is marketing the Ultra line of silver recovery and solution management systems manufactured by Snook/Rotex Corp.

According to Rene Gallet, National Supplies Manager, the Ultra systems feature automatic power control, easy hookup to automatic processors, maximum recovery efficiency and easy silver removal.

"Utilizing the Ultra silver recovery system makes the process a very economical one, especially in light of today's silver prices," Gallet said.



Training by Laser. Tanks participating in the U.S. Army's National Training Center exercises will be equipped with laser transmitters that will be used to simulate weapons firing. A receptor (inset) will be used to score hits on the vehicles. Both the transmitters and the receptors are linked to the Electronics Division's Range Measuring System to simulate battle conditions.

between scheduled trips to the center.

The system being demonstrated at Fort Irwin is mounted only on ground vehicles—tanks, jeeps and personnel carriers.

When fully operational, every Army combat battalion in the continental United States will rotate through the NTC every 18 months, receiving training that could not be duplicated at home bases.

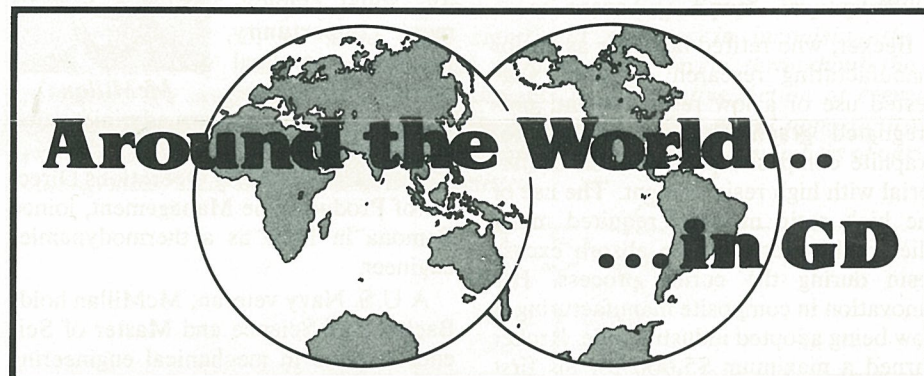
As presently envisioned, a typical battalion would be airlifted to Fort Irwin from its deployment airfield, immediately draw its equipment from prepositioned stocks and head for the field, either to the live fire range in the northern portion of the center, or to the instrumented range in the south.

For the next two weeks, the unit would

live in the field, following battle scenarios on the range. These battles last from 18-36 hours, and with the instant replay capability, the After Action Reports would be made to the commanders within hours of the end of an exercise. The commander could then choose between repeating the scenario or going on to another.

At the end of the first week, a unit on the engagement simulation range would redeploy to the live fire range, changing places with a sister unit from the same brigade.

When the two-week training period is completed, the brigade would be flown back to its home base, while another brigade enters training.



CHQ: Richard A. Bowhay was promoted to Manager of Corporate Purchasing... Susan E. Dong transferred from Electronics as Corporate Manager of Business Planning—Commercial & Resources... George E. Rettig was promoted to Internal Audit Manager—EDP... Lloyd G. Barnd joined as Corporate Graphics Specialist... Diane L. Mossler was promoted to Legislative Affairs Assistant in Washington... James T. Wilson joined as Corporate Office Services Supervisor... Vito M. Sardo has been named Senior EDP Audit Administrative Specialist based in San Diego.

Fort Worth: Donald M. Tye transferred from St. Louis as Project Manager... Richard E. Briggs was promoted to Fabrication Manager... John B. Herd Jr. was promoted to Manager, Support Equipment & Tool Control.

ATC: William C. Massey was promoted to Director of Operations.

Convair: Richard H. Taddiken was promoted to Manager—Estimating.

Pomona: George E. VanVeldhoven joined as Design Specialist... J. Patrick Rimer transferred from St. Louis as Assistant to the Vice President—Marketing... Tish-Chun Chang joined as Engineering Specialist... Holman L. Anderson was promoted to Chief—Inspection... John Lombardi was promoted to Quality Assurance Project Engineer... Wilton H. Power and Mark R. Seldon were promoted to Manager—Estimating... Norm D. Barton has been appointed Assistant Director of Navy Marketing for Moderate Range Tactical Systems.

Stromberg-Carlson: John W. Bull joined as Manager—Public Network Planning... Edward A. Cartwright joined as Principal Engineer... Enrique G. Comas was promoted to Supervisor Engineering Group I... Larry C. Cornwell joined as Director—Marketing Communications... Arthur R. Eastwood and Thomas L. Goulding were promoted to Manager—Engineering... Walter R. O'Connell joined as Marketing Sales Support Manager... V. A. Twaddell transferred from Pomona as Principal Engineer.

Electric Boat: Dale R. Banks was promoted to Chief—Cost Engineering... Elaine S. Briggs was promoted to Supervisor—Industrial Hygiene... Gary W. LaValley was promoted to Engineering Manager... Barry W. Pasqualini was promoted to Superintendent... Petros T. Petrides was promoted to Principal Engineer.

DSS: Calvin L. Massey was promoted to Manager—DSS DatagraphiX... James A. Blanchard was named Manager—Purchasing & Material.

Quincy Shipbuilding: Robert A. Babcock was promoted to Project Control Chief.

Electronics: Walter P. Robertson was promoted to Director—Product Support.

Freeman United: Kim C. Bingham was promoted to Assistant Superintendent—Fidelity Mine.

GDCC: Brij M. Lal was promoted to Proposal Engineering Manager... Terry I. Phillips was promoted to Systems Development Director.

Convair's Tomahawk Missile Chosen for Tactical Mission

The Department of Defense announced in March that it will request a proposal from Convair Division for full-scale engineering development of a new tactical medium-range air-to-surface missile (MRASM) using the Tomahawk cruise missile design as a base.

MRASM would be an extremely accurate, non-nuclear, tactical missile for the U.S. Navy and U.S. Air Force with a maximum operational range of about 300 miles. It could be launched from F-16s, F-111s, F/A-18s, A-6Es and P-3s against ships and a variety of land targets. MRASM would allow tactical aircraft to attack well-defended targets with a minimum of exposure and permit aircraft carriers to stand off a greater distance from a hostile coast.

In March, Dr. William J. Perry, Under Secretary of Defense for Research and Engineering, called for the development of MRASM in a memorandum to Navy Secretary Edward Hidalgo, Air Force Secretary Hans M. Mark and Joint Cruise Missile Program Office (JCMPO) Director Rear Adm. Walter E. Locke.

In the memorandum, Dr. Perry wrote, "I would like to see a development program to adapt the existing cruise missile to meet joint Navy-Air Force requirements for a tactical medium range air-to-surface missile. This new development program should be managed by the JCMPO, whose first task will be to

determine the baseline design most nearly compatible with the requirements of the Air Force and the Navy while making maximum use of the hardware already developed and tested."

According to the Pentagon announcement, the Convair Tomahawk cruise missile design was selected for MRASM for several reasons: First, minimum design modifications would be needed because of Tomahawk's modular design; second, existing production capability at Convair would be available for MRASM with a cost savings in comparison with beginning a new production capability; third, existing airframe components of the Tomahawk program could be used in MRASM development with additional cost savings, and finally, by using the Tomahawk design, MRASM can be developed with minimum risk since it uses existing and proven manufacturing technology.

Earlier in March, the DOD announced that The Boeing Company had been selected as the contractor to build air-launched cruise missiles for the Strategic Air Command. Boeing's AGM-86 had been engaged in a flyoff competition with Convair's AGM-109 for the contract.

Convair will continue working on other cruise missile engineering and production programs with contracts for Tomahawk submarine-launched and ship-launched cruise missiles for the U.S. Navy and ground-launched cruise missiles for the Air Force.

GD World

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The DIVAD Rollout Ceremony at Pomona

Pomona's DIVAD Is Shipped To Texas for Army Field Trials

Pomona's Division Air Defense (DIVAD) gun system has been shipped to Fort Bliss, Tex., for field testing by the U.S. Army.

Pomona's DIVAD system, mounted on a tank chassis, was rolled out during ceremonies at Pomona's plant on March 25th.

DIVAD is designed to give armored units effective defense against helicopters and fixed wing aircraft.

The rollout was witnessed by Army and Navy officials, General Dynamics representatives and almost a thousand Pomona employees.

During the ceremony, Ralph E. Hawes, Pomona General Manager, said "This program represents a new capability for the Army to have an air defense system made to run with the armor, fight with the armor and survive with the armor."

Pomona, which is competing with Ford Aeronutronic Division for the Army contract to build the DIVAD system, will have until early June to complete contractor tests. Between June and September, Army teams are scheduled to conduct field tests and evaluate the production proposals.

The award of the production contract is expected to be announced in late October or November.

The contract to build the DIVAD prototypes was awarded to Pomona in January 1978, and Pomona built two prototypes in just 27 months.

"By developing a prototype that incorporates proven system elements, we have concentrated our development effort," Hawes said.

One proven system contributing to the rapid development of Pomona's DIVAD is the fire control system which is derived from Phalanx, the radar-directed, air defense gun system now being produced for the Navy by Pomona.

The DIVAD system is equipped with twin Oerlikon KDA 35-mm. guns, widely

used by North Atlantic Treaty Organization countries, which fire armor-piercing rounds, as well as ammunition designed for air targets.

The Army is expected to procure over 600 DIVAD units in the next five years.

Dave McPherson, DIVAD Program Director, told the audience at the rollout that another key in the rapid development of the system was bringing all DIVAD program personnel together in the same area.

"By bringing the production people, the design people, the logistics and test functions together, we have been able to develop our DIVAD system rapidly and with maximum quality," McPherson said. "Integration of the support disciplines with the design disciplines has been a factor in our success to this point."

During his remarks, McPherson gave credit for the success of the prototype development phase to the members of the DIVAD team.

"The element that has made the difference is the people in our program, and we especially thank those of you who are part of that effort and the outstanding industrial team that is supporting us." Pomona's DIVAD industrial team includes Garrett Research, FMC, Delco, Honeywell and Oerlikon.

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FB-111As to Receive Advanced Electronics

The U.S. Air Force has begun a \$300 million program to improve the capabilities of 65 FB-111A bombers for the Strategic Air Command.

In the program Fort Worth will supply a stall-warning system for the aircraft, while other contractors will supply an aircraft-satellite telecommunications capability, a radar warning receiver and defensive electronic countermeasures systems.

The program is the largest aircraft electronic modification project ever undertaken by the Sacramento Air Logistics Center in California.

Dividends Declared

The Board of Directors of General Dynamics Corporation, meeting on April 3, 1980, declared a regular quarterly dividend of 30 cents per share on the company's common stock and \$1.0625 per share on its Series A preferred stock.

The dividend on the common stock will be payable on May 19, 1980, and the dividend on the preferred will be payable on May 15, 1980. The record date for both classes of stock is April 18th.

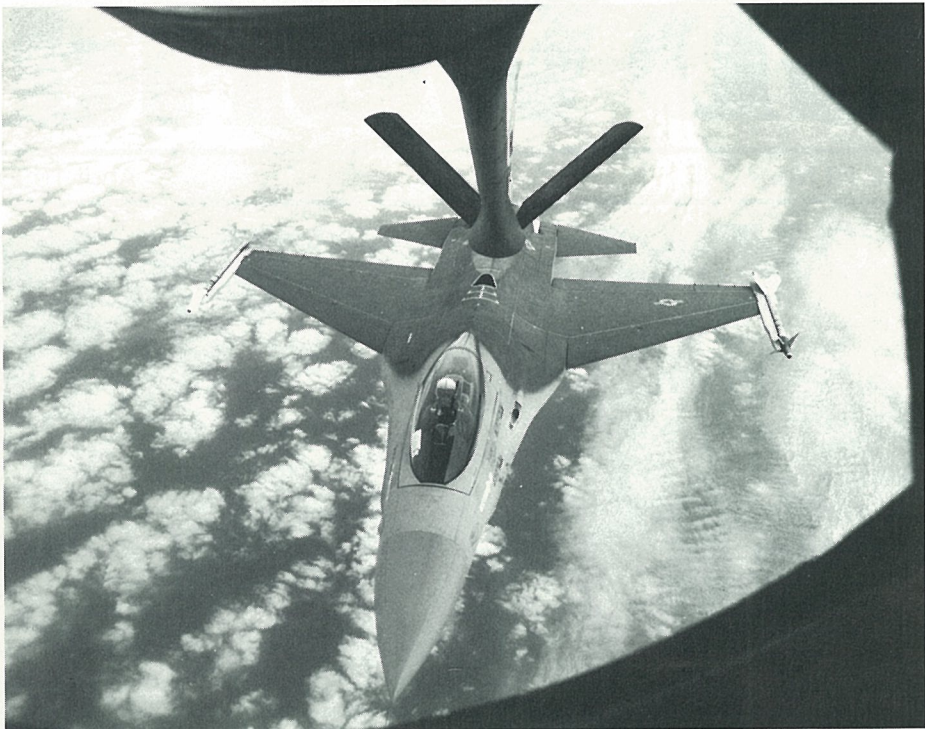


Photo Sequence Shows F-16 Performing a Half Roll

Dutch Plan Purchase Of 111 Additional F-16s

The Dutch Ministry of Defense has proposed to its Parliament that at least 30, and possibly 111, additional F-16s be purchased for the Royal Netherlands Air Force (RNLAf).

The ministry said it will begin negotiations to purchase 30 additional F-16s to supplement the 102 aircraft that are presently ordered to replace the RNLAf's F-104G Starfighters. In addition, the government said, it might purchase another 81 F-16s to replace four F-5 squadrons if negotiations could be completed in a year.



Simulated Deployment. A U.S. Air Force F-16 fighter positions itself beneath the refueling boom of a KC-135 Stratotanker to take on fuel during a recent 4,350-mile flight, which simulated a deployment to central Europe. F-16s making the flight required three air-to-air refuelings on the flight.

Hill F-16s Set Distance Record On 4,350-Mile, 10-Hour Flight

F-16 multimission fighters based at Hill AFB, Utah, set a nonstop flight record during a three-day exercise named Red Max Alpha during late March.

The record was set in a 10-hour, 4,350-mile flight which began the exercise and demonstrated the ability of the aircraft to deploy from Hill overseas.

The route for the flight went from Hill northeast to the Great Lakes, east to the Atlantic Coast, south to Florida, and west to Texas and back to Utah.

The F-16s were refueled three times by KC-135 Stratotanker aircraft assigned to units of Strategic Air Command. The aircrews were members of the 34th Tactical Fighter Squadron of the 388th Tactical Fighter Wing at Hill.

After landing back at Hill, the aircraft were refueled and prepared for two days of additional flying activities, which simulated interdiction and close air support missions.

During the three-day event, designed to evaluate aircrews, aircraft, support personnel and flying and maintenance operations in a wartime environment, 101 missions were flown by the 12 aircraft. The third day of the exercise was the heaviest; 61 missions were flown. Two of the F-16s led the way by flying seven times during the day. At the end of the exercise, nine F-16s were still maintenance ready to continue flying if necessary.



Australians Tour. Representatives from Commonwealth Aircraft, a potential coproducer of the F-16 in Australia, tour the F-16 assembly plant at Fort Worth. Looking over a main landing gear assembly are (from the left): Clive Allott; Malcolm Barrow; Helmut Niesner; Thomas Clark, a Fort Worth Division F-16 marketing specialist; Ken Wright; Arthur Nash, and Les Gray.

GD Convinced CF-16 Better for Canada

Editor's Note: The following statement was released April 10th by General Dynamics after the Canadian Government's announcement that it had selected the McDonnell Douglas F-18 as its New Fighter Aircraft:

The Canadian decision was not unexpected because it has long been apparent to us that the Canadian Forces were determined to have a two-engine aircraft, even though with today's modern jet engines it is generally recognized that there is little or no difference in aircraft safety between single and twin-engine aircraft.

It is difficult for us to understand the decision in view of the fact that the F-16 has higher performance, lower cost and is standard with several of Canada's NATO allies. We are absolutely certain that we had very superior industrial benefits for Canadian industry. Further, the CF-16s could have been supplied without risk as to schedule, cost and performance. We are convinced without question that the CF-16 would be the better solution to the Canadian New Fighter Aircraft requirement.

Savings And Stock Investment Values

Salaried	Feb. 1978	Feb. 1979	Feb. 1980
Government Bonds	\$ 1.9694	\$ 2.1107	\$ 2.3134
Diversified Portfolio	1.1472	1.2943	1.7238
Fixed Income	—	—	1.0634
Hourly			
Government Bonds	1.9669	2.1102	2.3124
Diversified Portfolio	1.1733	1.3235	1.7591
General Dynamics Stock	15.70*	30.25*	72.25

* Reflects 2½ to 1 stock split

Pomona Buyer Wins Award For Minority Firm Purchases

Pat Tatro, a Pomona Division buyer, has earned the General Dynamics Corporate Minority Business Enterprise Effort of the Year Award for 1979.

Her efforts earned her \$1,400: \$1,000 from the corporation and \$400 from the division.

The procurement program award is offered each year as an incentive to encourage business exchange with competitive small/minority-owned operations. The buyer's role is to contact businesses offering services needed by the division and invite their participation in the bidding process. As always, contracts are awarded on a competitive basis.

Tatro was responsible for a total of \$1,303,029 of contracts that were awarded to 22 minority and small businesses. Minority businesses are those companies owned by members of an ethnic minority and employ under 500 people. It is the first time a Pomona Division buyer has exceeded \$1 million in contract awards to minority businesses.

"At the beginning of the year, I set my goal at three quarters of a million dollars, thinking it would be a good year if I could



Pat Tatro

meet that goal," says Tatro. "Things started out well, and I just kept digging and managed to find more good people and companies to do business with."

"We have a very aggressive, corporate-wide program to encourage participation by these businesses," says Fred Flores, Small Business Administrator at Pomona Division. "Pat was very successful at finding people who can do a good job at a competitive price."

Electronics' Radars Protected Athletes at Lake Placid 21 106

After each day's competition in the Winter Olympics in February—while athletes from around the world slept and Jim McKay broadcast his reports to a fascinated audience—the New York State Police maintained a vigil over the Olympic Village at Lake Placid, N.Y.

Helping the police protect the athletes were four ground surveillance radars designed and manufactured by Electronics Division. Two of the AN/PPS-15 Infantry Radars were mounted on a tower in the village compound; two others were used beyond the compound's security fence to monitor several deep ditches and a frozen lake.

New York State Police Capt. Jerome L. O'Grady, the officer in charge of security for the games, said, "We found that the radar units were extremely accurate; they functioned well and were able to zero in on targets identified by other sensor equipment. They provided a security tool without giving the appearance that the Olympic Village was an armed camp, and they still enabled us to have a grasp of what was needed to provide security for the village."

Before the start of the Olympics, the state police began designing its security system and contacted Electronics for assistance. Electronics helped arrange a

loan of four radars from the U.S. Army and then modified them for police use.

According to Elmer R. Gauthier, PPS-15 Marketing Manager for Electronics, the two radars that were to be mounted on the 60-foot tower in the village required a special radome or protective covering. Working against limited time, Electronics personnel came up with immediately available, economical, off-the-shelf radomes—two large plastic trash cans. The cans were mounted on a base, given some internal stiffening and coated with electric blue paint. They worked.

The AN/PPS-15 is a ground surveillance radar that weighs about 30 pounds and can be carried and used by one soldier.

The unit detects movement, either by persons or vehicles. Electronics has delivered more than 1,600 units to the U.S. Army, Air Force, Marines and Immigration and Naturalization Service, and to the military forces of Canada, Spain, Argentina and the United Nations.

New York State Police officials reported after the Olympics that no unauthorized person arrived at the security zone of the Olympic Village undetected—all were met by police security teams before they could reach the fence.



Olympic Guard. A workman installs two Electronics AN/PPS-15 radars on top of a 60-foot tower inside the Olympic Village at Lake Placid, N.Y., prior to the beginning of the 1980 Winter Olympics in February. Electronics used two modified trash cans as radomes for the radars (inset).

Pair Win Honors For Contributions To Machining

Two members of Convair's Manufacturing Technology department—Earl Christian and Conrad Snyder—have received awards for their contributions to high-speed machining in the manufacture of cruise missile body sections.

Christian was presented with the division's top EXCEL honor, the General Manager's Award, for his role in the machining and welding of cruise missile parts.

According to Chuck Holland, Christian's supervisor, his contributions included establishing the processes and procedures for producing the parts, preparing the illustrations for the machine shop that defined each operation and working closely with shop personnel in translating these procedures to the finished parts.

While Christian was solving the problems of hand machining of cruise missile parts, Snyder, an associate in the Manufacturing Technology Department, was approaching the task from another point of view. Snyder was recently awarded \$1,000 for his work in adapting a Bryant spindle to allow computer-controlled high speed machining of the same parts. Both men's contributions led to the techniques and equipment that will be used in full-scale production of cruise missiles.

Christian has been with Convair for 23 years, and his work has been recognized by five EXCEL certificates in five different years.

He holds five patents, and his cost reduction proposals in 1979 alone are credited with savings of more than \$3 million.

Snyder has been with Convair for 27 years and has received one EXCEL award. He holds one patent and has been active in cost reduction proposals.

Australian Pilots Evaluate F-16

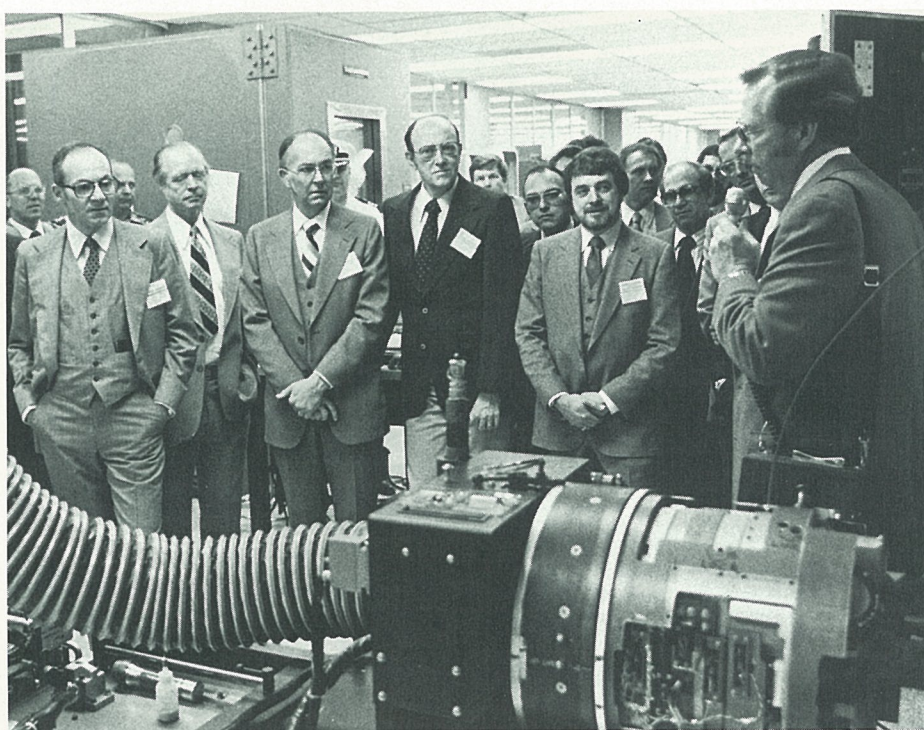
Royal Australian Air Force (RAAF) pilots have completed a second series of detailed evaluation flights of Fort Worth's F-16 multimission fighter. The F-16 is a finalist in the competition that will select Australia's next generation of fighter aircraft.

RAAF Group Capt. Bruce G. Grayson and Flt. Lt. Gerald Keough made four F-16 flights on April 3d and 4th to further investigate the fighter's suitability for Australian defense missions. Seven RAAF pilots now have flown F-16 production aircraft a total of 17 times.

Capt. Grayson, with five F-16 flights, is responsible for determining the operational suitability of the aircraft being considered for Australia's new tactical fighter. Lt. Keough is stationed at Luke AFB, Ariz., as an exchange pilot with the U.S. Air Force.

RAAF airmen first flew the F-16 last May at the U.S. Air Force's Flight Test Center at Edwards AFB, Calif., and at Fort Worth.

During the recent series of four flights, the RAAF pilots tested the F-16's air combat maneuverability and the capability of the F-16's weapons fire control radar, and carried out bombing and strafing runs on simulated tactical targets on air-to-surface missions using the fighter's weapons delivery system.



Suppliers' Tour. Chuck Blood (right), Director of Standard Missile Production at Pomona, explains Standard Missile assembly during a tour of Pomona facility for executives who represented 22 suppliers of missile components.

Standard Missile Suppliers Briefed on Need for Quality

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Representatives of 22 major suppliers to Pomona's Standard Missile Program recently attended a conference at the division which covered the future of the project, the importance of the subcontractors' role and the significance of the missile in fleet defense.

General managers, vice presidents and quality control managers from the 22 suppliers, which included General Electric, Sundstrand and Corning Glass, were briefed on the missile by Pomona Division program directors and U.S. Navy personnel.

"The performance record of Standard Missile is highly dependent upon the dedicated efforts of a great number of people and organizations across the country," said Mike Keel, Pomona Vice President and Director of Standard Missile Programs. "It is becoming increasingly important to combine our resources in order to operate efficiently and economically."

The Standard Missile is used by United States and allied fleets for protection against enemy air threats. The missile is built in four configurations—Standard Missile-1, ER (extended range) and MR (medium range); and Standard Missile-2, ER and MR. The missiles are an outgrowth of 27 years of technological evolution from earlier Terrier and Tartar missiles and can be used with the U.S. Navy's most advanced tracking and guidance system, the Aegis.

"Standard Missile is the only air defense system of its kind being produced for the Navy today," said Russ D. Cuddy, Standard Missile Program Manager, Naval Sea Systems Command in Washington D. C. "Standard Missile, with the help of your products, will continue as a key to fleet defense for a long time."

Lloyd Dutcher and Chuck Blood, Standard Missile Directors of Engineering and Production, spoke to the suppliers about the importance of quality assurance. Capt. B. M. Dalla Mura, Director of Engineering, Naval Surface Weapons Systems Engineering Station, and Capt. T. R. Mathis, Commanding Officer, Naval Weapons Station, Seal Beach, Calif., touched on the same subject.

Captain Dalla Mura illustrated the need for good quality controls by tracing the supplier's product from his loading dock to final assembly at the Naval facility in Seal Beach.

"By the time your torque motor or component has reached Pomona, been integrated and assembled and is loaded aboard ship, those parts have changed hands at least four times," he said. "We trust that three years later, if a target comes up on the screen, the missile will successfully engage the target. I'm sure you can see how important your products become in this situation."

Suppliers were enthusiastic about the conference. "This conference was very helpful," said William D. Summers, Marketing Vice President for Globe Industries. "We've been able to see how the project is run as a whole."

Some of the participants planned to use the information at their home offices to give employees working on Standard Missile components a better understanding of the importance of their work.

"Our employees are building a torque motor for the system, and we want them to know they are helping to defend America," said Nicholas D. Trbovich, Chairman and President of Servotronics, Inc., a company that received an award from General Dynamics for excellent service. "It is important for them to know what their work is contributing to, and that they understand the need for quality. We hope to take this back to them."

22 Departments At Fort Worth Honored For Safety

Twenty-two departments at Fort Worth Division were honored recently for achieving perfect safety records during 1979.

The division was given the first place safety award for aircraft manufacturing by the Texas Safety Association and was awarded the General Dynamics' Chairman's Award for excellence in safety performance for the third consecutive year.

More than 2,000 employees in the 22 departments worked a total of 3.2 million manhours without a single lost-time injury.

One of those departments, Instrumentation, was singled out for having a record 19 years—a total of 4.66 million manhours—without a lost-time injury.

Richard E. Adams, Fort Worth Division Vice President and General Manager, awarded plaques at the annual safety dinner and praised the outstanding safety record of the division's 15,000 employees.

"I think it tells two things about the people who live together and work together at the plant," Adams said. "First, it shows that they are quality craftsmen who take pride in their work and in their own safety and in the safety of others."

"Secondly, it shows that the supervisors are interested in training and in the welfare of their employees."

Adams also said the safety consciousness is reflected in the quality of the F-16, a fighter that is being delivered consistently on or ahead of schedule and that is on target in costs.

"They go hand in glove together," Adams said.

Hill Sergeant Is 1st Woman To Fly in F-16

Karen Zeigler, U.S. Air Force Staff Sergeant who has worked with the F-16 for more than two years, did something recently that few of her colleagues in maintenance ever have or ever will.

She flew in one of the sleek multimission fighters now being manufactured at Fort Worth.

With the ride, an honor she received for being cited as the Noncommissioned Officer of the Year for the 16th Aircraft Maintenance Unit at Hill AFB, Utah, Sgt. Zeigler became the first woman ever to fly in an F-16.

"It was pretty unbelievable," she said after the 70-minute flight.

"I have never flown in anything like that before. I was really impressed with the plane before, because I have been working with it since it came out, but I am even more impressed with it now."

"I have always thought it was a wonderful plane, but now I have even more good things to say about it."

Sgt. Zeigler was taken on her flight by Lt. Col. Samuel H. Holmes of the 388th Tactical Fighter Wing at Hill.



Staff Sgt. Karen Zeigler

"He let me handle the flight control stick for a little while," she said. "I was really impressed with the ease that it took to maneuver the F-16."

Sgt. Zeigler, who has been in the Air Force seven years, said she and Col. Holmes flew at supersonic speeds during part of the flight.

"That, too, was an unforgettable experience," she said. "You can feel the plane begin to accelerate and as soon as you hit it (the speed of sound) it gets very quiet inside the plane, you can't hear anything. There is no sense of movement. Everything seems to be standing still."

On the ground, Sgt. Zeigler is a radar and instrument technician.

"I really love working on the F-16," she said. "It's a dream to work on. And I've been with F-16s since they went to Edwards AFB in California."

"Before that, I was working on the F-111s, which were also made by General Dynamics," Sgt. Zeigler said.

DatagraphiX To Show Systems As Bankers Meet

DatagraphiX will exhibit its latest computer output management systems at the American Banking Association's National Operations and Automation Conference, May 18-21, at the New York Hilton Hotel.

DatagraphiX will demonstrate the recently introduced DeskMATE reader that fits in a desk drawer, a major new advance in microfilm readers; the Mini-AutoCOM microfiche recorder; the DataMASTER 250 microfiche duplicator; and several reader products including the Model 1500DL microfiche reader printer and the DataMATE 100 microfiche reader.

The new DeskMATE reader features easy installation and operation and offers excellent image quality, positive focusing and a dual lens option allowing the user to switch between source document and COM-generated microfiche.

GD World

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Pierre Laclede Center, St. Louis, Mo. 63105
Manager of Internal Communication
G. Alexander Smith



Shipbuilding Capability. The skills of the employees at Quincy Shipbuilding Division and the capabilities of the yard to immediately respond to U.S. Navy requirements were displayed at the Navy League's 1980 Convention and Sea-Air-Space Exposition which was held in early April in Washington, D.C. The photograph above, which was part of the GD exhibit, shows work being performed at Quincy on

(from the left) LNG Lake Charles, a liquefied natural gas tanker; Seatiger, an oil tanker; another liquefied natural gas tanker, and USNS Neptune, a U.S. Navy cable repair ship. Other General Dynamics divisions which were represented in the corporate display at the convention were Electric Boat, Pomona, Convair, Fort Worth and Electronics.

Marine Facilities Help Convair Build Cruise Missile Launcher

General Dynamics facilities at Charleston, S.C., and Quonset Point, R.I., contributed to Convair Division's successful launching of a U.S. Navy/General Dynamics Tomahawk cruise missile from an armored box launcher last month.

The Charleston facility welded major sections for two seven-ton box launcher cover assemblies, 23 feet by 6.5 feet by 6 feet, that are made primarily of aluminum.

The function of the cover assemblies is to provide an armor shell to completely protect the launch tubes in closed position. On command, the cover rises to firing position and the Tomahawk's rocket booster is fired, launching the missile from the tube.

Quonset Point fabricated the lower box assembly and its base which were then shipped to Convair for final assembly.

Working on an extremely tight schedule, Quonset Point and Charleston used a combination of raw material, parts machined by Quonset, parts machined by Convair and parts machined at Charleston. The cooperative effort was completed on time and within budget.

Charleston developed the assembly tooling and method of manufacture for the cover and executed the assembly and welding under very close optical measurement monitoring to ensure adherence to extremely close tolerances.

DatagraphiX Receives \$6 Million A-NEW Contract

A \$6 million contract was awarded in early April to DatagraphiX for continued production of the AN/ASA-70 Tactical Data Display Group. This is the 12th consecutive production contract awarded by the Department of the Navy to DatagraphiX for the system.

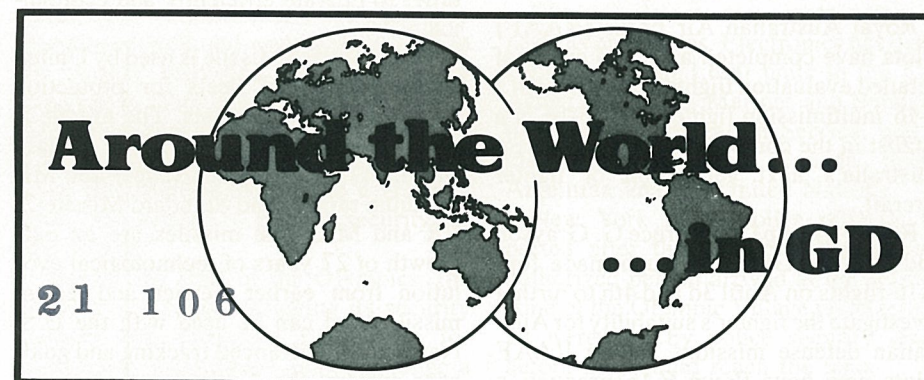
The AN/ASA-70 display system is installed aboard the P-3C Orion, a land-based patrol aircraft used primarily for antisubmarine warfare. The AN/ASA-70 is the display portion of the A-NEW system of antisubmarine warfare sensors and control equipment, which enables the crew to detect and pinpoint the location of enemy submarines.

The AN/ASA-70 consists of four Charactron cathode ray tube (CRT) visual display units. Two large Charactron CRTs are used for visual representations of the area of the ocean being scanned. One

screen is used to display an area, picking up indications of submarines sent by radar and other sensors.

The other large CRT is used by a Tactical Coordinating Officer to pinpoint the exact location of an enemy submarine. This screen displays data relayed to the computer by sonabuoys (sonar devices dropped into the ocean from the plane), infrared cameras, etc. By comparing the data obtained from a variety of sources and mapping the coordinates, the exact location can be determined and appropriate action taken.

The recent DatagraphiX production contract is for 19 sets which will be installed on P-3C aircraft for use by the U.S. Navy, Japan and the Netherlands. Two hundred ten display sets have already been produced.



CHQ: Kernan J. Crotty joined as Corporate Manager — Financial Planning... Charles H. Lloyd joined as Corporate Manager — Financial Planning-Aerospace... Edward J. Stiften was promoted to Corporate Financial Analyst... John J. Stirk joined as Corporate Government Relations Counsel... Wayne V. Chadderton joined as Corporate Senior Tax Accountant... W. Joyce Dowell joined as Internal Auditor... John E. Zimmerman was named Corporate Manager — Commercial Business Analysis... James F. Hall was named Corporate Marketing Manager — Europe.

Pomona: William H. Neal was promoted to Manager — Product Support... Adrian M. Messner, Ronald M. Peterson and William A. Reinman were named Engineering Specialist... Walter C. Miller was promoted to Project Engineer... Donald T. Flynn and Richard L. Lockwood were promoted to Section Head... Len O. Anding has been named DSS Site Manager at Pomona... Frank Caruso joined as Accounting General Supervisor.

Stromberg-Carlson: Raymond G. Burton was named Manager — Rochester Manufacturing Operations... Donald W. Barrett transferred from Eastern Data Systems Center as Deputy Program Director — DCO... Peter J. Lyons was promoted to Engineering Manager.

Electric Boat: John W. Harrington was promoted to Deputy Director — Systems.

Fort Worth: Clarence E. Hart Jr. was promoted to Chief Project Engineer... Olin H. Beaver was promoted to Production Manager — EPO... George L. Davis was promoted to Manager, Management Relations and Education Programs... John W. Grimes was promoted to European Resident Office Manager... Victor E. Gurule was promoted to Manager, F-16 Modernization Programs... Billy F. Hendrix and Henry G. Pendley were promoted to Manager — Finance... D. L. Pratt was promoted to Chief F-16 Modernization Programs... William B. Rose was promoted to Deputy Program Director — F-16-ILS... Jerry A. Sills was promoted to Director — Product Planning.

Convair: Walter E. Mooney Jr., was named Engineering Chief... Ulf Brynjestad was promoted to Project Engineer Senior... James F. Dietz transferred from St. Louis as Manager — Finance.

Lewis Reports GD Positioned Well for Future

"With the national economy moving into a recession period, General Dynamics is fortunate in being well positioned to withstand the business uncertainties and fluctuations that must be faced," David S. Lewis told the corporation's shareholders on May 1st.

Speaking at the annual shareholders' meeting in St. Louis, the Chairman and Chief Executive Officer reported earnings for the first quarter of 1980 were \$36.3 million, or \$1.33 per share of common stock, 23 percent above the \$29.5 million, or \$1.08 per share, for the first quarter of 1979.

Sales during the three-month period ending March 30th were \$1.07 billion, compared to sales of \$895.6 million for the first quarter of 1979.

"Our balance sheet is stronger than ever, our backlog of work is at an all-time high and prospects for future growth continue to be good," Lewis said.

"Our commercial operations will, of course, be adversely affected by the general slowdown in business activity, and we are already beginning to feel the impact. However, we believe the strong base provided by our large backlog of very high priority government programs will enable the company to continue to grow during these uncertain times."

Turning to the corporation's operations, Lewis said the F-16 program at Fort Worth is "a model of excellent management, consistently delivering aircraft on or ahead of schedule, within costs, and with very high quality..."

"At Convair, work continues to go well on preproduction contracts for the U.S. Navy's Tomahawk sea-launched cruise missile and the U.S. Air Force's ground-launched cruise missile," he said. "Convair has been requested to submit a proposal for full-scale engineering development of a tactical Medium Range Air-to-Surface Missile, a program which has the possibility of adding substantially to the division's already solid base of cruise missile work."

Lewis noted that Pomona was recently awarded a contract by the U.S. Army for initial development of terminally guided submissiles for the Assault Breaker, a new concept in antiarmor warfare, and had delivered its prototype Division Air Defense Gun system to the Army's test range at Fort Bliss, Tex.

Continued on Page 4

Ayers, Veliotis Elected to Board



Ayers



Veliotis

During the annual shareholders' meeting, a 17-member Board of Directors was elected, including two new members: Thomas G. Ayers and P. Takis Veliotis.

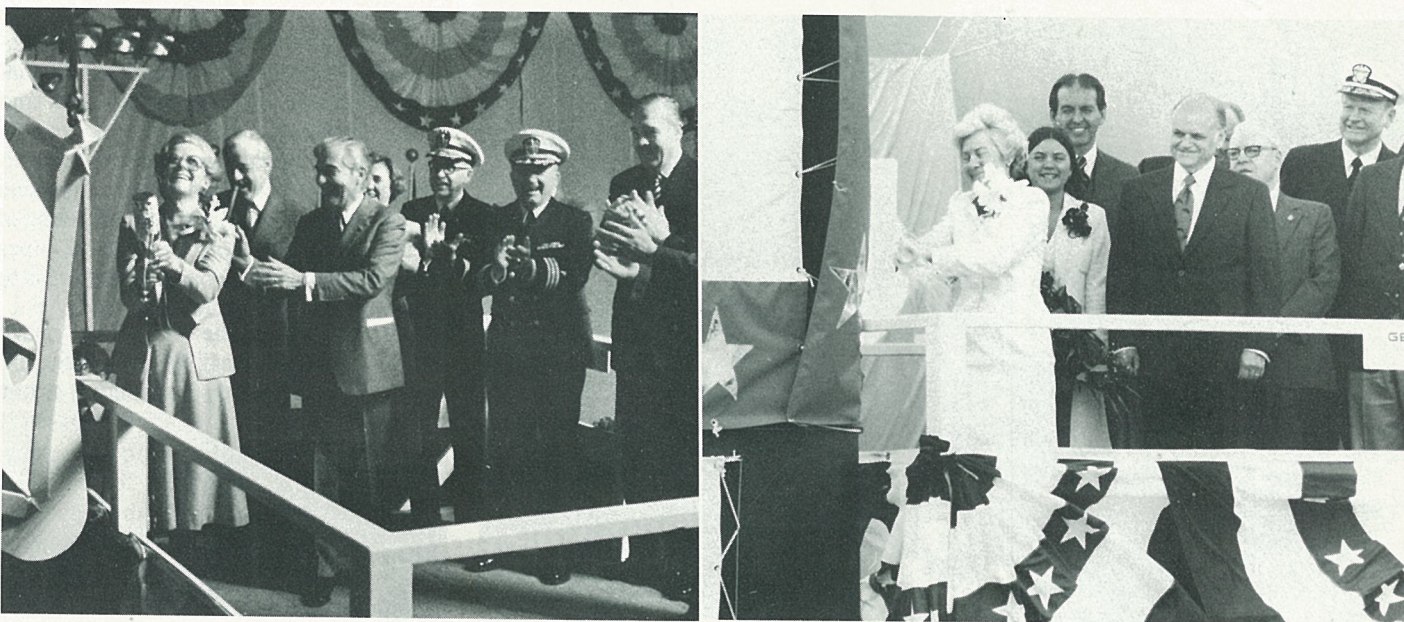
Ayers is former Chairman and Chief Executive Officer of Commonwealth Edison Co. of Chicago. He began his business career as Manager of Industrial Relations with Public Service Co. of Northern Illinois in 1938 and joined Commonwealth Edison in 1952 as Assistant Vice President. He is a member of the Board of Directors of Sears, Roebuck & Co., and Zenith Radio Corp.

Veliotis, GD Executive Vice President-Marine and General Manager of Electric Boat, joined the company in 1973 as President and General Manager of Quincy Shipbuilding Division. Under his leadership, the first of several liquefied natural gas tankers to be built in the United States was completed and delivered. In 1977, he was named General Manager of Electric Boat.

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Bottles Smash. Mrs. Edward Hidalgo, (at left) wife of the Secretary of the Navy, smashes the traditional bottle of champagne on the bow plate of Boston, launching the U.S. Navy's newest 688-class fast attack submarine at Electric Boat on April 19th. A week later, Mrs. Lucien Nedzi, (at right) wife of the Chairman of the House Armed Services Installation and Facilities Subcommittee, christens the Michigan, the second Trident ballistic missile submarine, on April 26th.

EB Christens USS Boston, USS Michigan

In a very busy period in late April, two U.S. Navy submarines were christened at Electric Boat on consecutive weekends. On April 19th, EB's 11th 688-class fast-attack submarine, the *Boston*, slid into the Thames River, and on April 26th, the *Michigan*, the nation's second Trident submarine, was christened in the graving dock of the Land Level Submarine Construction Facility.

During the christening ceremony for the *Boston* (SSN 703), Secretary of the Navy Edward Hidalgo hailed the fast-attack submarine and her sister ships as "the vanguard of our leadership well into the next century."

Hidalgo termed the launching of the 360-foot, 6,900-ton vessel "a tribute to the many people and organizations that

support this fine and splendid shipyard" and called the Electric Boat workforce "really the unsung heroes."

The Secretary spoke of "the serious test of our leadership today," and said that "eternal vigilance is still an imperative and will continue to be so..."

He said that the Navy was constantly working to improve its strength and capability for immediate response. "I am absolutely confident," he continued, "that we shall continue to respond."

Following Hidalgo's address, the sponsor's party moved to the christening platform at the bow of the *Boston* and Cmdr. Robert C. Mellett, a Navy chaplain, blessed the ship.

While Karen Hidalgo, sponsor and Secretary Hidalgo's wife, champagne bottle in hand, posed for photographers, Wilfred L. Chaput, an Electric Boat outside machinist, waited below in the trigger pit to release the ship for the slide into the Thames River.

Chaput was accorded the honor as "trigger man" for his quick thinking and courageous action in helping minimize damage from a minor fire on the *Michigan* on April 8th.

The launch signal to Chaput wasn't long in coming. When it did, as Mrs. Hidalgo smashed the bottle on the bow-plate, he shoved the trigger forward, and *Boston* began to slide, stern-first, into the river. As the ship plunged in, an estimated 7,000 spectators gave her a rousing sendoff.

Earlier, David S. Lewis, General Dynamics' Chairman, had noted that April 11th was the 80th anniversary of the U.S. Submarine Service. It was on that date in 1900 when the Navy accepted its first submarine, the *Holland*, from Electric Boat. "Throughout those 80 years..." he said, "there has been one goal for the thousands of men and women (at Electric Boat, and that is to produce the greatest quality (submarines) that their personal efforts can possibly provide."

P. Takis Veliotis, General Dynamics' Executive Vice President-Marine and Electric Boat Division General Manager, termed *Boston* the "New Ironsides," referring to one of Boston's historical treasures, USS *Constitution*, also known as "Old Ironsides."

"Today the City of Boston gets a 'New Ironsides,' and I hope you will be as proud of her as we are."

Veliotis said that the capabilities and resources of General Dynamics in Groton, Quincy and Quonset Point are supported "by the skills of thousands of men and women... who represent, in my view, the best shipbuilding team in America today."

Then on April 26th, at the christening of the *Michigan*, the Chairman of the Installation and Facilities Subcommittee of the House Armed Services Committee termed the development and deployment of the Trident ballistic missile submarine "the heart of our nuclear strategy."

Continued on Page 4

DOD Authorizes Production Start For Tomahawk

Convair has received a \$13.6 million production contract from the Department of Defense to initiate production of the BGM-109 Tomahawk Cruise Missile.

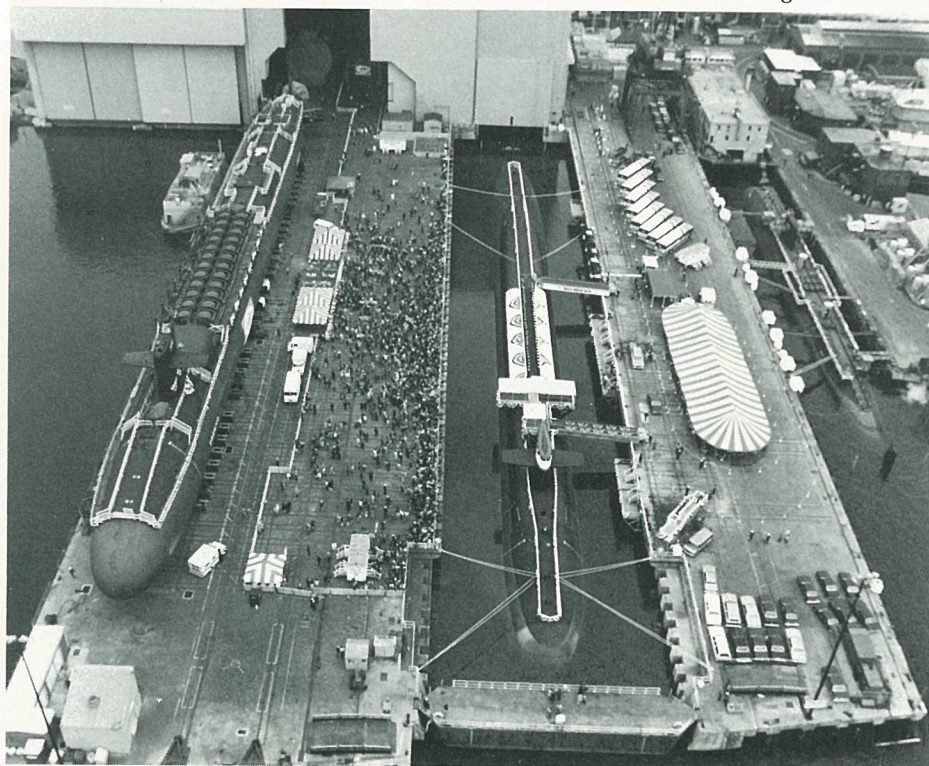
Ralph MacKenzie, Convair Vice President and Program Manager for the BGM-109 Tomahawk, said, "This is our long awaited contract to start production on the Tomahawk in what is anticipated to be a major production run for the company in providing both land-attack and antiship Tomahawks to the U.S. Navy."

According to MacKenzie, the first contract increment covers production of components and subsystems to support assembly and test of six Tomahawks for the Navy - three land-attack missiles and three antiship versions. He said the Tomahawks will be delivered to the Navy to meet a 1982 initial operational capability when they will go on station aboard attack submarines.

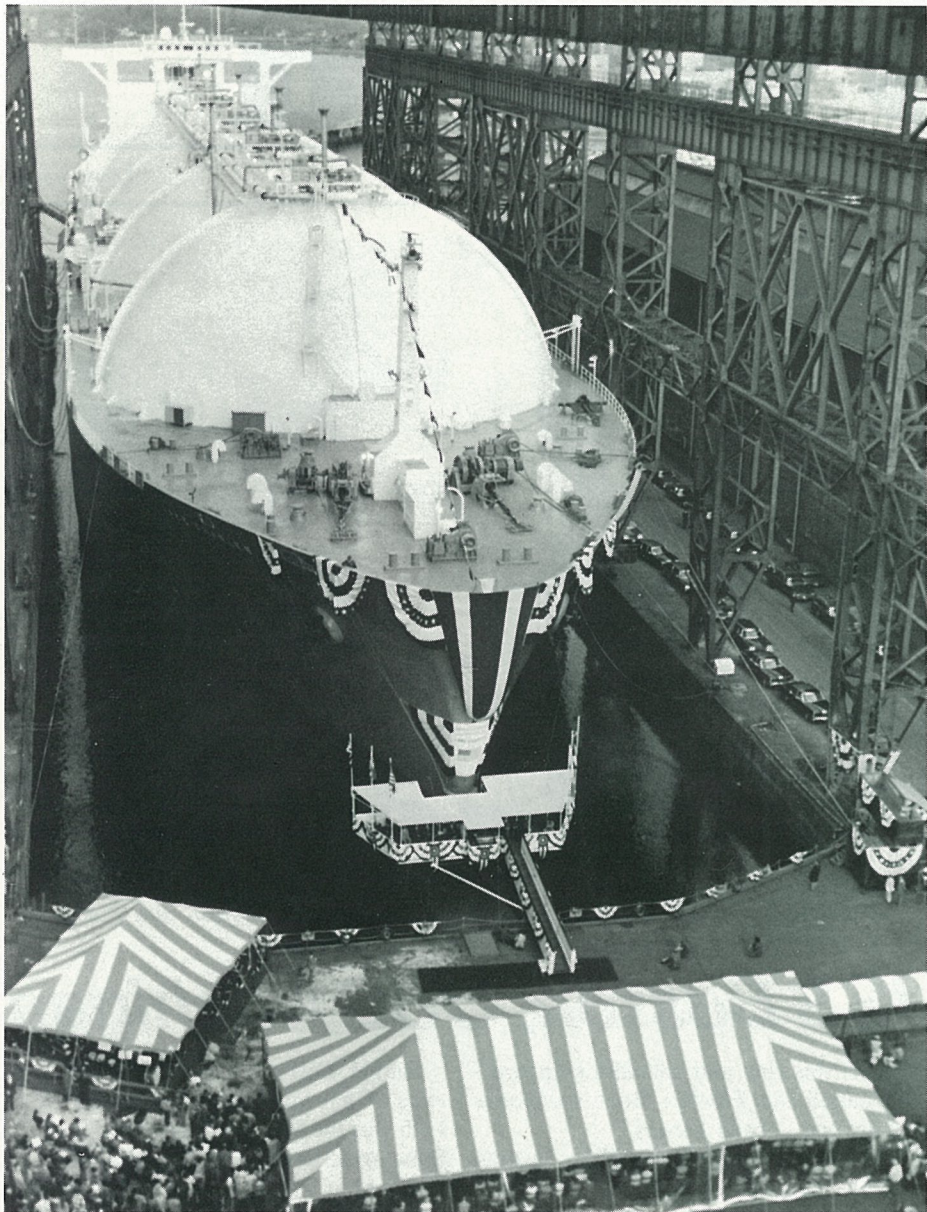
The contract also includes funds to initiate procurement of long lead items for continued production in 1981 when the Defense Department is expected to procure an additional 20 Tomahawk cruise missiles - 16 antiship and four land-attack versions - for the Navy.

The Tomahawk sea-launched cruise missile program has achieved an excellent record of success throughout its development that began with initial concept studies in 1972. Following the studies and competitive hardware development and testing, Convair was selected prime contractor for the Tomahawk in March 1976. The selection followed two successful underwater launches near San Clemente Island.

Continued on Page 2



Undersea Power. The *Michigan* (SSBN 727) floats in the graving dock of the Land Level Submarine Construction facility at Electric Boat during her christening ceremony, between the SSBN 728 (left), another Trident submarine, and the *Boston* (SSN 703).



Tanker Christened. Lake Charles, the first liquefied natural gas tanker built by General Dynamics which will transport the vital energy source to the United States, was christened during ceremonies at Quincy Shipbuilding Division on April 18th.

Quincy's Ninth LNG Tanker Is Christened Lake Charles

The *Lake Charles* – the ninth liquefied natural gas (LNG) tanker to be built at the Quincy Shipbuilding Division – was christened last month during ceremonies at the shipyard.

The *Lake Charles* is the first of two LNG ships being built for Lachmar, the partnership organized by Panhandle Eastern Pipe Line Company of Houston, Tex., Moore McCormack Resources Inc. of Stamford, Conn., and General Dynamics, to transport liquefied natural gas from Algeria to the U.S. Gulf Coast.

The second of the Lachmar tankers, the *Louisiana*, is scheduled for completion later this year.

The 125,000-cubic-meter *Lake Charles* was named by Mrs. Richard L. O'Shields, wife of the Chairman and Chief Executive Officer of Panhandle

Eastern. Panhandle has a long-term contract with Algeria's national oil and gas company, Sonatrach, to purchase LNG for use by gas customers in southern and midwestern states.

A Moore McCormack subsidiary will operate the Lachmar ships, which will deliver the gas to a terminal at Lake Charles, Louisiana.

The eight LNG tankers previously built at Quincy are continuing to deliver liquefied natural gas from Indonesia to Japan for use by several utilities and industrial firms.

Since the initial delivery of gas to Japan by the *Aquarius* in August of 1977, the Quincy-built ships have transported more than 28 million cubic meters of LNG to terminals in four Japanese cities. All of the ships are American registered, and manned by American crews.



Thank You. Mrs. Richard L. O'Shields, (center) sponsor of the LNG tanker Lake Charles, and David S. Lewis, General Dynamics' Chairman and Chief Executive Officer, talk with flower girl Catherine Woodford at April 18th christening ceremonies at Quincy Shipbuilding Division. Nine-year-old Catherine is the daughter of Daniel Woodford, a supervisor in the Production Support Department at Quincy.

EB Develops Ultrasonic Tests For Rapid Inspection of Welds

Electric Boat has designed a new system which can perform inspections on welds. The system uses a new ultrasonic (pulse echo) imaging and recording system and has broad potential commercial application in the quality control and inspection fields.

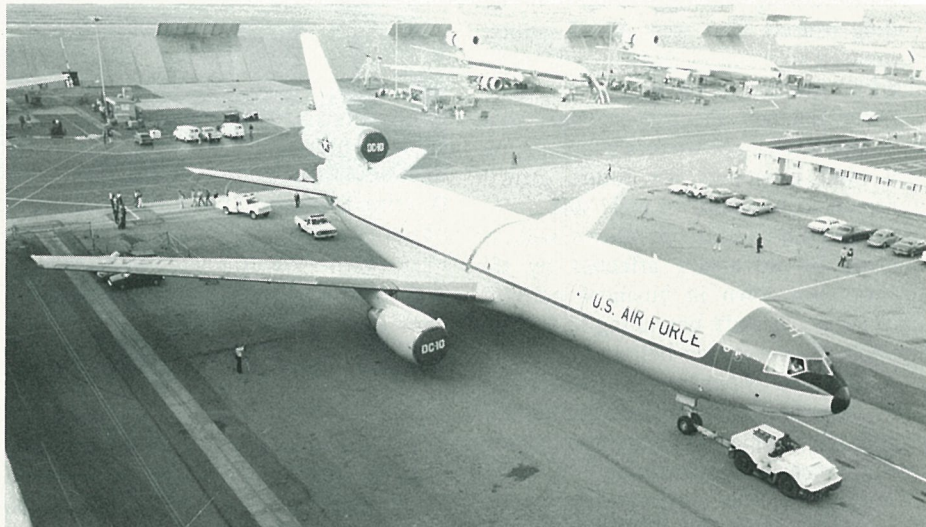
The new Ultra-Image system, developed to inspect submarine welds, permits the precise measurement and recording of weld defects and corrosion inside pipes without having to rip out affected areas to determine the extent of defects.

EB officials say the oil and gas, heavy vehicle and machinery manufacturing industries have already signified a strong

interest in the system.

Components of the compact, portable system include a hand-held terminal, microprocessor and memory boards, digital pulse receiver, digital graphics display, scanner and power supply.

The new system grew out of an independent research project initiated in December 1973 by Electric Boat's Non-destructive Technology Group. Jointly funded by the company and the U.S. Navy, the project developed an ultrasonic instrument to nondestructively inspect submarine seawater system components on ships already in service.



Extender Rolled Out. The U.S. Air Force's first KC-10A Extender cargo/tanker aircraft (above) was rolled out during a ceremony at the McDonnell Douglas Corp. Plant in Long Beach, Calif., on April 16th. Convair builds the main fuselage of the Extender, whose mission is to increase the mobility of U.S. forces in contingency operations.

Tomahawk Production Started

Continued from Page 1

Fifteen more flights occurred through January 1977, during the validation program in which the Tomahawk demonstrated its ability to carry out land-attack and over-the-horizon antiship tests on simulated operational missions.

Thirty-three more flight tests followed during the full-scale engineering development phase including a series of survivability demonstrations. It was apparent that the missile could be used for other purposes, and the success of the Tomahawk program led to other applications. In May 1978, a Tomahawk carried out an airfield-attack demonstration dispensing submunitions over a simulated runway showing that the missile could be used to attack enemy airfields.

"The airfield-attack demonstration," MacKenzie said, "contributed to the decision by the Defense Department to develop and procure the conventional land-attack Tomahawk."

The first submarine launch occurred in 1978, and in September 1979, the missile was tested vertically from a ground launcher to prove the vertical launch concept. In March of this year, an antiship Tomahawk was fired from a surface ship for the first time. The ship-launched test was made from an armored box launcher aboard the USS *Merrill* (DD 976).

MacKenzie pointed out that the company has received go-ahead for full scale engineering development tasks to adapt Tomahawk for launching from a vertical launch system installed aboard surface

ships. He said that *Spruance* (DD 963)-class destroyers could be made capable of carrying from 40 to 70 Tomahawks deployed in a vertical launch system.

A new requirement is now emerging for the development of a tactical medium-range air-to-surface missile (MRASM) based on the Tomahawk design. The non-nuclear MRASM would have an operational range of about 300 miles and could be launched from F-16s, F-111s, F/A-18s, A-6Es and P-3s against ships and a variety of land targets.

In the 50 flights thus far, Tomahawk missiles have accumulated more than 40 hours of free flight time while covering more than 18,000 nautical miles. Twenty-eight launches have been made from Navy A-6 Intruder aircraft; 14 from under water; six from ground platforms; one from a ship motion simulator; and one from the deck of the USS *Merrill*.

In addition to producing the sea-launched cruise missile for the U.S. Navy, Convair is developing a ground-launched Tomahawk system for the U.S. Air Force. The Tomahawk ground-launched cruise missile will be launched from Air Force transporters capable of off-road movement and quick deployment to remote locations. The company has long lead funding for the first 11 ground-launched Tomahawk missiles and associated launch equipment.

The sea-launched, ground-launched and MRASM programs are under the direction of the Department of Defense's Joint Cruise Missile Project.

Savings And Stock Investment Values			
	March 1978	March 1979	March 1980
Salaried			
Government Bonds	\$ 1.9797	\$ 2.1294	\$ 2.3372
Diversified Portfolio	1.1764	1.3704	1.6055
Fixed Income	--	--	1.0719
Hourly			
Government Bonds	1.9872	2.1291	2.3363
Diversified Portfolio	1.2032	1.4018	1.6388
General Dynamics Stock	17.40*	32.75	67.12
* Reflects 2½ for 1 stock split			

Following Easy Rules Reduces Risks Caused by Hypertension

Note: Dr. McCann, President of the Life Extension Institute, is a recognized authority in the field of occupational medicine, and advises the corporation on its medical and health maintenance programs.

By John P. McCann, M.D.

Hypertension is the medical term for high blood pressure, which is a serious health problem of major proportions. It affects an estimated 23 million Americans, or at least one out of every six adults. The exact percent in any group depends upon age, sex, weight, race and whether other family members have or have had high blood pressure. This progressive disease contributes directly or indirectly to one million deaths a year.

May has been selected as National High Blood Pressure Month, and General Dynamics endorses this national effort. I urge all GD employees to become involved.

When people talk about blood pressure, they often speak of it as if it were something bad or dangerous. Actually, everyone has blood pressure, and it's either normal, high or low. Only rarely is low blood pressure a reason for concern. If blood pressure is high, there is always a cause for concern. Fortunately, however, modern medicine can keep high blood pressure under control in most cases.

The normal blood pressure for an individual depends upon factors such as age, sex and overall health, and blood pressure varies at different times of the day and under different conditions in the same individual. Blood pressure readings will be higher in periods of physical exertion or emotional excitement and lower when a person is calm or rested.

Blood pressure is measured as the heart contracts, forcing blood through the circulatory system, and when it relaxes preparing for the next contraction. Doctors measure blood pressure at both times by measuring the pressure in millimeters of mercury. Pressures of 90- to 140-mm. of mercury when the heart is contracting and 60- to 90-mm. when the heart is relaxed are considered to be within the normal range for an adult. Anything higher than 140-mm. when the heart is contracting and 90-mm. when the heart is relaxed should be evaluated by a physician.

High blood pressure that is undetected and untreated can cause death and is a major contributor to heart disease, strokes and kidney failure. It can damage the eyes and cause blindness and affect the brain, heart, blood vessels and kidneys. Furthermore, those individuals with high blood pressure usually die at a much earlier age than those with normal blood pressure.

The cause of high blood pressure is unknown for 90 to 95 percent of all persons who suffer from the condition. This type of high blood pressure is called essential hypertension and can be diagnosed and controlled by medical supervision.

The remaining 5 to 10 percent of the population that suffer from high blood pressure are said to be suffering from secondary hypertension which can be traced to specific, treatable causes.

Unfortunately, hypertension doesn't usually produce any symptoms until it has already damaged the brain, the heart or the kidneys. Therefore, it is important for everyone to have blood pressure checked on a yearly basis; this includes children, 15 percent of whom are hypertensive.

The risk of essential hypertension can be reduced by adopting a healthy lifestyle that includes:

- An annual blood pressure check.
- No smoking.
- Restricted salt intake (salt in cooking where required is acceptable, but not the routine use on prepared foods).
- A diet low in fat and cholesterol.
- Keeping weight within normal limits.
- Exercise.
- Reduction of stress to a minimum and development of positive ways to cope with unavoidable stress.

If a person develops hypertension, in addition to the lifestyle outlined above, he or she must strictly adhere to a physician's advice. If medication is prescribed, it must be taken as directed.

To protect yourself and your family, make certain all family members are given a blood pressure check annually. Maintain a calm atmosphere in the home - take time to relax and laugh, and finally, adopt a lifestyle consistent with good health. That's really the good life - a healthy one.

Fort Worth Inspects F-16 Parts By Combining X-Ray With TV

Fort Worth has blended the penetrating power of the X-ray with the immediate viewing advantages of television to drastically cut inspection times on the F-16 fighter assembly line.

Technicians are using a fluoroscopic, or X-ray, system developed by personnel in the Quality Assurance, Manufacturing Technology and Facilities departments, combined with a television system to inspect bonded F-16 parts, including wing flaps, vertical tails, rudders and horizontal stabilizers.

This inspection system can spot any possible faulty welds, damaged cores, incomplete core splices or foreign objects not visible to the eye.

Under a conventional X-ray system, it would take two people eight hours to X-ray a wing flap, according to M. T. Wilcox, who headed the team that developed the new inspection system. Now it takes a single person just 20 minutes to do the same job.

"In the conventional system, the wing flap had to be moved often to position it for X-ray and film placement," Wilcox said. "Then there was a long waiting time for the film to be developed and interpreted."

"Now, from a seat at the control console, a single operator shielded by a lead glass window simply moves the fluoroscopic camera across the flap or other component being inspected," he said. A television camera then scans the image produced by the X-ray unit and displays it on a TV monitor.

"If no defects are observed on the monitor by the operator, the part is accepted and a photographic record is automatically kept on a video cassette tape. If a defect is noted, a standard X-ray photo is made of the area and is used as a template for repairs," Wilcox said.



Prince's Visit. Norwegian Crown Prince Harald (right) is briefed on the cockpit of the F-16 multimission fighter by Herbert F. Rogers (left), Fort Worth's Vice President-International Programs, as Royal Norwegian Air Force Maj. O. S. Sagen listens.

Convair Team Cited by NASA For Work on HEAO Program

Three Convair employees from Launch Vehicle Programs were cited recently by the National Aeronautics and Space Administration's (NASA) Marshall Space Flight Center for their contributions to the High Energy Astronomy Observatory (HEAO) program.

The space agency selected Bob Benzwi, Pat McGuire and John Schnabel to receive NASA's Achievement Award for the three-mission HEAO program.

R.J. Mugavero Named Senior Vice President

Richard J. Mugavero has been promoted to Senior Vice President of General Dynamics Communications Co.

In his new position, Mugavero will be responsible for general corporate administration and will assist the President on special assignments.

Mugavero became Vice President of Administration in 1976 and served as Director of that department the preceding year.

In 1974, he was named Director of Communications Operations at Stromberg-Carlson Communications, Inc. (SCCI), now GDCC. From 1970 to 1973 he worked as manager, then director of administrative services, at United Business Communications (UBC), which later merged to form SCCI. Prior to UBC, Mugavero served as the director of contract administration at Automatic Electric Company.

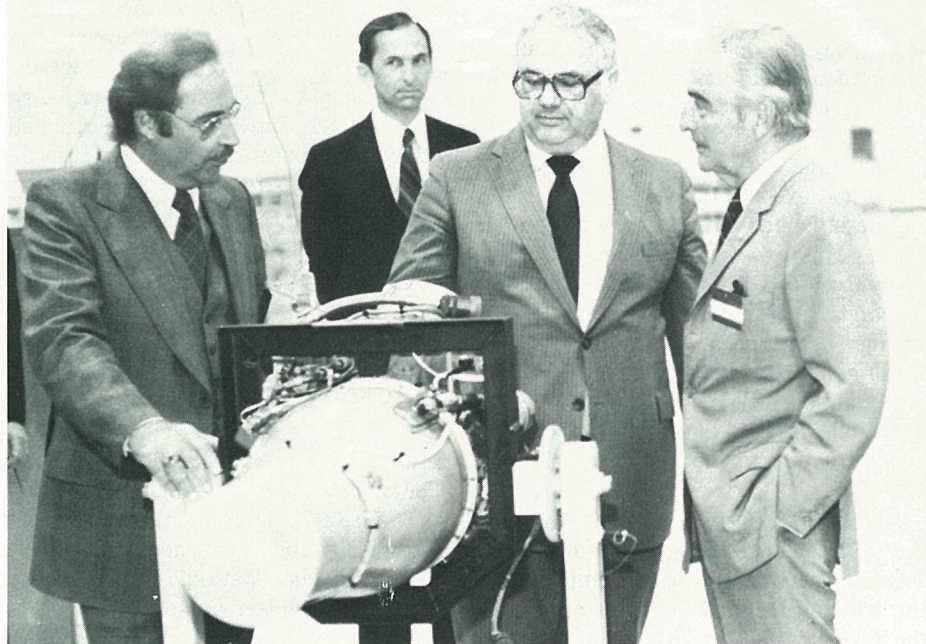
Graduated from Michigan State University in 1960, Mugavero holds a Bachelor of Business Administration degree.

Benzwi served as the HEAO Mission Manager during the program; McGuire was the lead engineer responsible for encapsulating, transporting and mating observatories to the Atlas-Centaur launch vehicles, and Schnabel was the spacecraft coordinator providing special services to the experimenters. McGuire and Schnabel are part of the permanent Convair launch team at Cape Canaveral, Fla.

According to Benzwi, many Convair employees in Engineering, Manufacture and Quality Assurance and the launch team at the Eastern Test Range contributed to the perfect Atlas-Centaur launches that placed the three HEAO observatories in their precise orbits.

"I'd like to thank and commend them for their support and for demonstrating the reliability and versatility of the Atlas-Centaur," Benzwi said.

The three HEAO observatories are the heaviest satellites ever launched by Convair's Atlas-Centaur. The first lifted off in August 1977, the second was launched in November 1978 and the final mission blasted off from the Eastern Test Range in September 1979. The program has provided scientists with a capability to study X-rays, gamma rays and cosmic rays emitted by stars, quasars, pulsars and black holes throughout the universe. Scientists believe that the HEAO X-ray pictures which recorded radiation created 10 billion years ago by distant stellar objects may help to clear up some of the mysteries of how the solar system and the universe were formed.



Secretary's Visit. Edward Hidalgo (right), Secretary of the Navy, met with Ralph S. MacKenzie, Tomahawk Program Director (left), and Dr. L. F. Buchanan, Convair General Manager, during a recent visit to Convair. The Secretary received status reports on the Tomahawk cruise missile program and made a tour of the cruise missile assembly area.

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Lewis Reports GD Positioned Well for Future

Continued from Page 1

Speaking of the marine divisions, Lewis noted that the last of the liquefied natural gas (LNG) tankers currently under contract at Quincy Shipbuilding Division, the *Louisiana*, will be delivered later this year.

"We continue to be optimistic about the long-term prospects for new LNG ship orders," he said. "However, this new business seems to be a number of months away at best...."

"In the meanwhile, we have been successful in obtaining other shipbuilding work for Quincy, and this will go a long way toward keeping the nucleus of this fine shipbuilding team together until additional LNG ship orders are received," Lewis said.

The Chairman said that seven Trident ballistic missile-firing submarines were in various stages of construction at Electric Boat, and that Congress had authorized the construction of the eighth ship. The Navy has indicated it plans to procure 13 or more of the submarines, which can be built only by Electric Boat.

In other areas of the business, Lewis said the domestic resources operations performed well in the first quarter in spite of the economic climate, but he expressed doubt that the improvement would continue through the year.

The country's economic downturn has begun to affect the telecommunications subsidiaries—Stromberg-Carlson, American Telecommunications and General Dynamics Communications—which showed reduced activity compared with the previous year, he said.

Lewis summed up the position of the company by saying, "Overall, the past year has been one of real achievement by the men and women of General Dynamics, and we are off to a good start in 1980."

EB Christens Boston, Michigan

Continued from Page 1

Speaking at the christening ceremonies for the second ship of the Trident class, Congressman Lucien N. Nedzi, Democrat of Michigan, called the project "simply indispensable."

Congressman Nedzi said the Trident submarine, "because of its firepower and range... will have more 'sea room' than our older submarines and be less detectable, less vulnerable, less dependent on foreign bases."

The Congressman said he hoped that when *Michigan* is retired "on some distant day," it will have helped preserve the peace "ever vigilantly, yet never having fired its awesome nuclear punch in anger."

Nedzi praised the men and women "who conceived and managed this project," saying that it was "no routine assignment." He said that those people are, rather, "asked to be pioneers in concept and in craftsmanship, taking (their) skills to the outer limits of knowledge and execution."

The highlight of the ceremonies came later, when the Congressman's wife, Margaret Garvey Nedzi, christened the *Michigan*. With the words, "In the name of the United States, I christen thee *Michigan*. May God bless her and all who sail in her," Mrs. Nedzi smashed the traditional bottle of champagne on the superstructure of the 560-foot, 18,750-ton ship.

As the *Michigan's* whistle blew and the U.S. Coast Guard Band played "Anchor's Aweigh," cheers went up from the spectators on the platform next to the huge graving dock in which *Michigan* floated. The platform and dock are part of the shipyard's 10-acre Land Level Submarine Construction Facility specially designed and built for Trident construction.

Navstar Program Receives Boost from Convair

Two major events in the Department of Defense Navstar Global Positioning System (GPS) program occurring in late April involved two divisions of General Dynamics.

On April 25th, Electronics Division submitted its technical proposal for full-scale engineering development of the Navstar GPS Operational Control System. The following day a Convair-built Atlas F rocket boosted the sixth Navstar satellite into orbit from the Western Test Range at Vandenberg AFB, Calif.

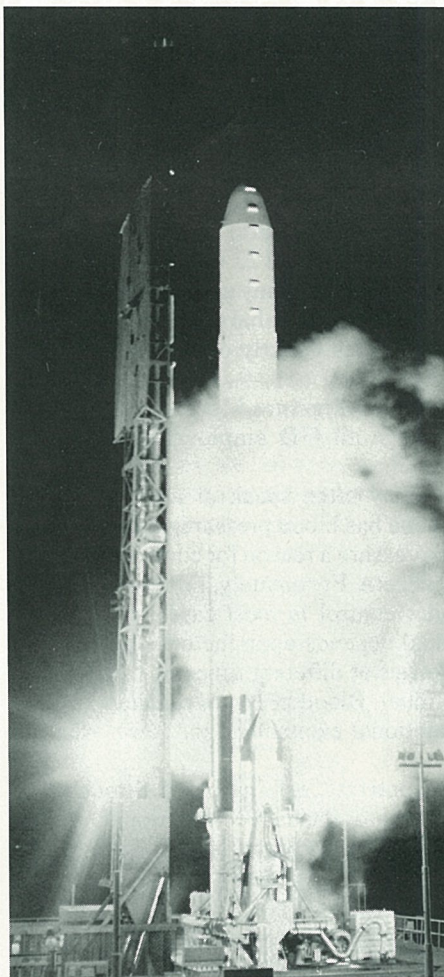
The GPS effort is a multi service program that is expected to provide precise position and navigational information to the military services and civilian users as well. Equipped with a GPS receiver set, users will be able to get highly accurate three-dimensional position and velocity information and a precise timing reference in real time through 18 Navstar satellites. In any weather, 24 hours a day, anywhere on earth, Navstar satellite data will be available to establish a user's position within 16 meters, speed within a 10th of a knot and time within a fraction of a second.

According to Jim Collins, GPS Marketing Manager for Electronics, submitting the full-scale engineering development proposal culminated a two-year preliminary design effort by the division and its teammate, Ford Aerospace & Communications Corp. of Palo Alto, Calif., for the competitive phase of GPS involving the Operational Control System.

"The winner," Collins said, "should be selected by September of this year, and, after contract award, the winning contractor will complete detail design, build the equipment, develop the software and deploy the system."

Three contractor teams have submitted proposals for the program worth in excess of \$100 million.

George Breitwieser, Vice President for the GPS Program, said, "The cooperation and support in putting together



Atlas F Boosts 6th Navstar

this voluminous proposal in response to our customer's requirements was exceptional.

"It took a lot of hard work, long hours and dedication on the part of everyone.

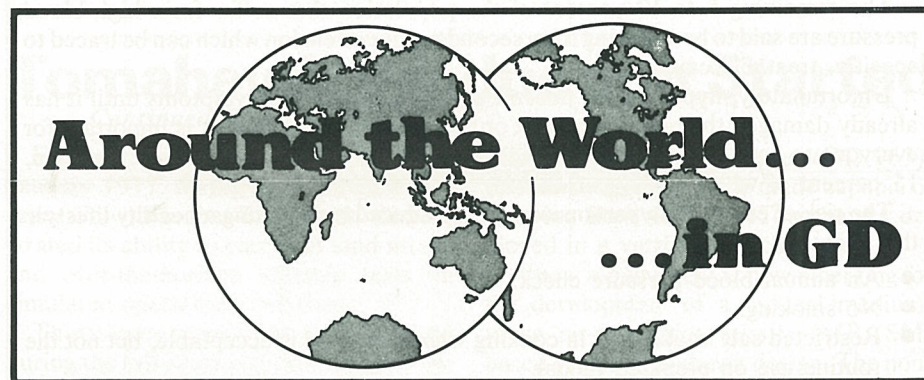
We are confident that we have a very comprehensive and competitive proposal that will yield dividends in winning this important program for the division," he said.

The hub of the Operational Control System will be the Navstar Operations Center planned to be located at Peterson AFB, Colo. Collins said the Operations Control System also includes tracking and monitor stations in other areas of the world. The global tracking network is expected to be operating by 1985.

Collins pointed out that Electronics Division has been under contract for GPS since 1974, when it was selected prime contractor for the control and user equipment development during the validation phase of the program. It was at that time also that Convair's Atlas F launch vehicle was chosen to boost the satellites to form the orbital-based navigation constellation.

As systems developer and integrator for the GPS control and user segments during the validation phase, Electronics designed, built and installed a master control station at Vandenberg and four special satellite monitoring stations located in Alaska, Hawaii, Guam and California.

That system has been operational since 1977, and Electronics continues to be responsible for its overall operation and maintenance, Collins said. It will be used through 1984 when the Operational Control System goes on-line, he said.



CHQ: Denise A. Gible joined as Corporate Senior Staff Accountant... Leighton E. McCormick joined as Corporate Manager of Communications... Dennis E. Fiehler was promoted to Supervising Senior Auditor... James F. Hall was promoted to Corporate Marketing Manager Europe (Brussels)... John F. Langer was promoted to Corporate Chief Pilot... June R. Scheuble joined as Associate Auditor.

Convair: Louis R. Imbimbo was promoted to Superintendent... Dennis J. Keane and Jeffrey S. Lewis were promoted to Engineering Chief... Robert C. Ring was promoted to Engineering Manager... M. P. Dudeck and R. W. Lockner transferred from Electronics as Design Specialist... M. J. Hurley transferred from Electronics as Engineering Specialist Senior... Glenn W. Bancroft and Andrew R. Robertson were promoted to Manager of Manufacturing Engineering... Michael J. Janus was promoted to Chief-Numerical Control Systems.

Electric Boat: Robert H. Dargel was promoted to Engineering Supervisor... Daniel J. O'Donnell was promoted to Design Supervisor... Harold L. Drurey joined as Chief of Engineering.

Quincy Shipbuilding: Dan H. Teodorson was promoted to Design Chief... William J. Bieryla was promoted as Director-Maintenance, Facilities & Administrative Services.

Fort Worth: Edwin H. Bellman was promoted to Assistant Project Engineer... Robert M. Dallas transferred from St. Louis and was promoted to Marketing Manager... Lester L. Deaton was promoted to Chief of Procurement... George E. Nolet was promoted to Production Management Specialist... Olin E. Weiss was promoted to Manager of Facilities Planning... John R. Lopez Jr. was promoted to Group Engineer... Wesley T. Beard was promoted to Engineering Manager... John C. Chahansky joined as Marketing Manager... James G. Jones was promoted to Change Proposal Supervisor... Z. Joe Thornton joined as Senior News & Information Specialist.

Pomona: Henry J. Michalski was promoted to Chief-Production Support... Garland P. Thacker was promoted to Director-Manufacturing... Armand Beltramo Jr. and Jesse J. Halstead were promoted to Engineering Specialist... Thomas S. Carlton was promoted to Manager-Production Quality Assurance... Leighton H. Watling was promoted to Group Engineer... Howard M. Maculsky transferred from WDSC and was promoted to Manager-Manufacturing Operations Analysis & Planning.

Stromberg-Carlson: John E. Frederiksen and Dale V. Leppert were promoted to Supervising Engineer, Group I... Robert A. Kelly joined as Field Integration Services Director... Rudolph P. Kopriva joined as Manager, Industrial Sales... Robert A. Lindsay joined as Supervisor, Engineering Electronic Design... Harold A. Staats joined as Principal Engineer.

DSS: John J. Wickersham joined as Manager-Industrial Relations... John D. Hurley was promoted to Manager, DSS-Electric Boat... Jerome R. Pikulinski transferred from corporate headquarters to CDSC as Senior Software Engineer.

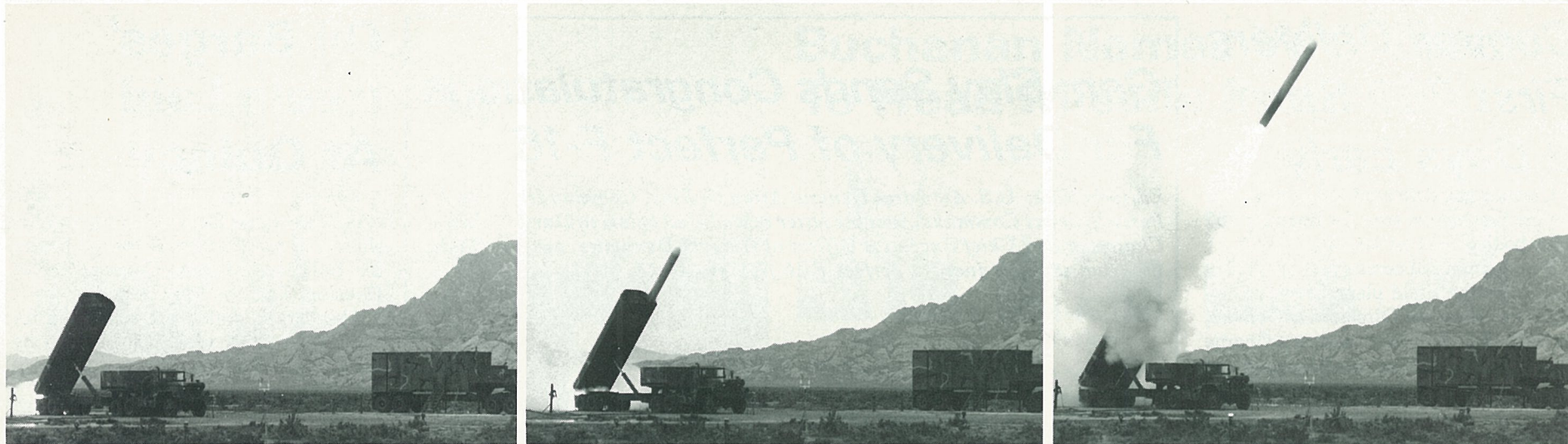
ATC: John Tymoczko Jr. was promoted to Vice President-Marketing.

New Display Will Be Introduced at Show

DatagraphiX will introduce its 132-70 display system and demonstrate the company's latest information management systems at the National Computer Conference on May 19-22 at the Convention Center in Anaheim, Calif.

The 132-70 is compatible with IBM 3278/3274 computers and includes the 132-78 display station, 132-80 printer and 132-74 cluster controller.

The 132-70 system is the newest addition to the DatagraphiX family of 132-column display terminals that eliminate the need for reformatting and reprogramming of data required with standard 80-column displays.



GLCM Firing. The first test of a Tomahawk ground-launched cruise missile was conducted by the Joint Cruise Missiles Project at the Utah Test and Training Range.

The Tomahawk was launched from a prototype of the launch platform that will be operated by the U.S. Air Force. (Photos Courtesy of Department of Defense)

GD World

Vol. 10 No. 6

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June 1980

Pomona's DIVAD Destroys Drone in Army Test

Facing its first test against an airborne target, Pomona's prototype of the Division Air Defense (DIVAD) gun system demonstrated its effectiveness by destroying a helicopter drone with the first burst of gunfire during tests conducted at Fort Bliss, Tex.

The successful firing, a major development testing milestone, took place just two days after the beginning of the contractor demonstration phase of DIVAD tests on the remote desert range. Within eight days, 20 percent of the contractor's test objectives had been completed by the Pomona team.

"This is what we've all been working for over the last two years," said Warren Seyfert, DIVAD Test Operations Director. "The results confirm that our system is performing the way we want it to. Our successful firing on the QH-50 (helicopter drone) sets the stage for the other tests we will be conducting in coming weeks."

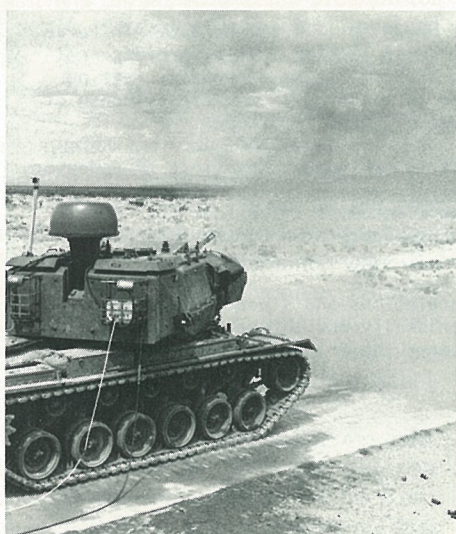
Twenty-eight months ago, the U.S. Army awarded competing contracts to Pomona and Ford Aeronutronic to develop DIVAD systems under a prototyping-for-production concept. The DIVAD will meet the Army's urgent need for an air defense system designed to counter enemy close air support threats to armored units.

Prototyping-for-production development will cut five years from the normal acquisition time of the sophisticated system by adapting the design of existing hardware to the requirements of the needed system. One key to Pomona's DIVAD is the proven Phalanx fire-control system, a radar-directed air defense system designed by Pomona engineers which is currently under production for the U.S. Navy.

DIVAD's turret, featuring twin Oerlikon 35-mm. cannons, automatic target acquisition radar and a stabilized optical sight for shoot-on-the-move capability, is mounted on a tank chassis to guarantee maximum survivability and mobility in the forward battle area.

"The success of this test mission demonstrates the effectiveness of our DIVAD system against a representative threat," said Tom Lewis, Technical Director of the DIVAD program. "Even though there is much work yet to be done, I want to congratulate the people on the program who worked hard to bring us to this first significant testing milestone. DIVAD is the most sophisticated and demanding system ever developed by this division in such a short period."

In addition to firing on the helicopter drone, DIVAD test crew members have taken the system through optical and radar test tracking missions involving helicopters and high-speed, fixed-wing aircraft. DIVAD has also fired over 1,300 rounds to determine the system's effectiveness against air and ground targets.



Successful Test. Pomona's Division Air Defense (DIVAD) gun system unleashes its two 35-mm. cannons at a helicopter drone during tests at Fort Bliss, Tex., engaging and destroying the target with the first burst of gunfire.

In conjunction with contractor tests, instructors from Pomona have completed training of Army crews who will operate the system throughout the Army's Operational and Development Tests.

Following contractor demonstration tests, which will be completed in mid-



June, the Army will begin a 90-day development test/operational test of the systems and evaluation of the production proposals of Pomona and Ford. Based on results of the competition and other factors, the Army will then select one system for large-scale production over the next five years.

MRASM Begins Mission Effectiveness Tests

The U.S. Navy and Convair have begun a series of suitability tests to demonstrate the mission effectiveness of the new medium range air-to-surface missile (MRASM) deployed on carrier-based aircraft.

Objective of the six-month demonstration program is to provide early confirmation of the MRASM's ship and aircraft compatibility. The tests will be concluded with the catapult launch of a Navy attack aircraft with a MRASM installed on its wing pylon.

Earlier this year, the Department of Defense announced that the MRASM will use the basic Tomahawk cruise missile design to meet joint Navy/Air Force requirements for a medium range air-to-surface weapon system. The MRASM would be an extremely accurate, nonnuclear, tactical missile with a maximum operational range of about 300 miles.

When used aboard carriers of the fleet, it could be launched from Navy attack aircraft such as the A-6 Intruder and the A-18 Hornet. Candidate launch aircraft for the Air Force include the B-52 as well as several tactical fighter aircraft such as the F-16 and F-111.

The demonstration will make maximum use of fleet personnel and involves loading, handling and storage tests of the MRASM aboard an aircraft carrier, catapult and arrestment tests at the Naval Air Test Center, Patuxent River, Md., with a MRASM mounted on the wing pylon of an A-6, and at-sea catapult launch of the

aircraft and missile from the USS *Kitty Hawk*.

In one of the tests at Patuxent River, an instrumented MRASM air vehicle on an A-6 will be used to measure environments and loads imposed during catapult and arrestment flight operations.

The Tomahawk cruise missile, from

The rain clouds that had drenched northern Utah for three weeks lifted slightly on the morning of May 16th, allowing Convair engineers to make the first successful launch of a Tomahawk ground-launched cruise missile (GLCM) from a transporter-erector-launcher.

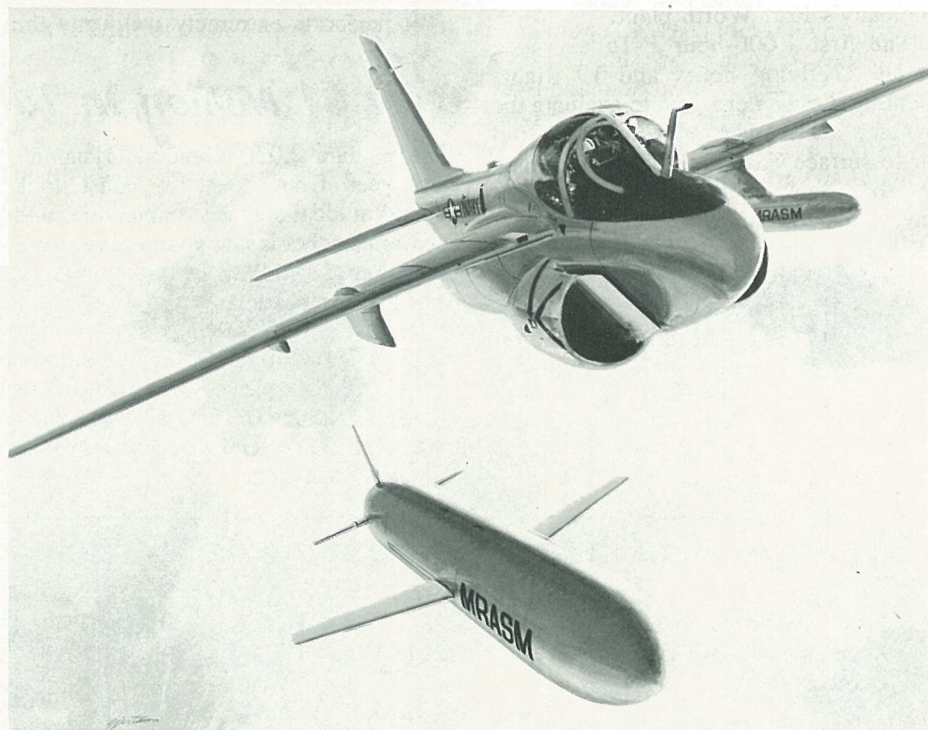
Just before 8:30 a.m. at a test complex 30 miles west of the main base at Utah Test and Training Range, the missile was fired from the truck-mounted launcher and began following its preprogrammed course, ending with a parachute landing in the recovery area north of the launch site.

The test was a major step in the development of the GLCM weapons system, and Convair Program Director Jerry Butsko said, "This success reflects the fine efforts of all the Convair, associated contractor and government personnel who contributed."

The GLCM is identical to the U.S. Navy Tomahawk sea-launched cruise missile, and the test was the 51st flight test made by the missile from land, sea and air platforms.

Current plans call for the 1,500-mile-range GLCM to be operated by the U.S. Air Force in Europe to improve the theater nuclear capability of the United States and its allies.

which the MRASM is derived, has been under development at Convair since 1972. The company recently received its first production contract for the Navy Tomahawk sea-launched cruise missile and is the prime contractor for the Tomahawk ground-launched cruise missile for the Air Force.



MRASM Launch. A Convair medium-range air-to-surface missile (MRASM) is launched in this artist's concept from a pylon of a U.S. Navy A-6. The missile is undergoing a demonstration to determine its suitability for operations from Navy carriers.

Convair Delivers First 767 Strut 3 Days Early

Convair has delivered ahead of schedule the first engine strut for Boeing's 767 wide-bodied twin-jet aircraft.

During informal ceremonies June 2d at the Lindbergh Field plant, Dennis Dunbar, Strut Program Director for Convair, turned over the first unit to Charlie Waldrop, Boeing Contract Manager, and Ed Kilcup, Boeing's Resident Manager, three days ahead of schedule.

"This is the first major item of structural hardware delivered for the 767 program and marks a significant milestone," Dunbar said. "It is the forerunner of a program that will evolve into a production run of struts for 400 aircraft," he said.

The engine strut turned over to Boeing is a test article that will be trucked to Boeing's Wichita, Kan., facility where it will be used for engine nacelle compatibility fit checks. Four other test struts, as well as the first production strut, will be delivered later this year by Convair.

Each of the engine struts is about 25 feet long and weighs approximately 1,300 pounds. The struts are made of machined steel, aluminum fittings and machined aluminum bulkheads, while the aft and forward fairings are made of composite materials. Two design configurations can accommodate turbofan engines manufactured by Pratt & Whitney and General Electric.

Edwards F-16 Hits Milestone Of 1,000 Hours

The first F-16 fighter to fly 1,000 hours reached that milestone recently at the U.S. Air Force Flight Test Center, Edwards AFB, Calif.

The single-seat F-16, 75-0747 (A-3), is one of eight assigned to flight test and prove important aircraft systems and mission capabilities during an on-going joint operations program at Edwards involving Air Force and General Dynamics personnel.

The aircraft reached the 1,000-hour mark on its 696th flight, with General Dynamics test pilot Alex Wolfe at the controls. The fighter first flew on May 3, 1977.

The F-16 was designed for a minimum service life of 8,000 flying hours, or 15 years of Air Force flight operations. In a program which successfully demonstrated the inherent ruggedness of the Air Force's newest fighter, General Dynamics engineers tested an F-16 to 16,000 equivalent flight hours in a computer-controlled durability test apparatus at the company's Fort Worth plant.

The first 1,000-hour F-16 averaged about 27 flying hours and 19 flights monthly during a program to evaluate the fighter's all-weather radar, air-to-air and air-to-surface weapons delivery accuracy and the efficiency of the aircraft's cockpit environmental control system.

"The airplane could easily have exceeded this operational rate," said Charlie Harrison, General Dynamics Flight Test Manager at Edwards. "However, the frequency of test flying is affected by the need to change aircraft configurations and test instrumentation between flights and the availability of test ranges and aerial targets."

Gen. Slay Sends Congratulations For Delivery of Perfect F-16

Editor's Note: U.S. Air Force General Alton D. Slay, Commander of the Air Force Systems Command, sent the letter reproduced below to David S. Lewis, Chairman and Chief Executive Officer of General Dynamics, congratulating the team that produced a perfect F-16 fighter (A-61).



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR FORCE SYSTEMS COMMAND
ANDREWS AIR FORCE BASE, DC 20334

19 May 1980

Mr. David S. Lewis
Chairman and Chief Executive Officer
General Dynamics Corporation
Pierre Laclède Center
St Louis MO 63105

Dear Dave

I was very pleased to hear that on 29 April 1980 the U.S. Air Force accepted delivery of a "perfect" F-16 fighter. This aircraft, which was found free of discrepancies after rigorous acceptance testing and inspection on the ground and in flight, is concrete evidence of General Dynamics' desire to produce a quality product.

A "perfect" product is difficult to achieve in any field of endeavor, but in the complex world of aircraft manufacturing, I know that the difficulties are multiplied many times over. The fact that this aircraft contained major components fabricated by the F-16 European coproducer companies makes the feat even more noteworthy.

I would like to offer my congratulations and sincere thanks for this excellent performance to you personally and to the great team you have producing that great fighter - the F-16.

Sincerely

ALTON D. SLAY
General, USAF
Commander

General Creech Praises F-16 As Aircraft Perfect for TAC

General Dynamics' F-16 multimission jet fighter continues to earn praise . . . this time from a ranking U.S. Air Force general.

Speaking before an Air Force Association gathering in Fort Worth, General W.L. Creech, Commander of the Tactical Air Command (TAC), described the F-16 as a great weapon system which has been doing a good job for the Air Force since its acquisition by TAC in August 1978.

"It performs extremely well, and the

pilots like it," he said during his presentation comparing U.S. and Russian defense forces. "TAC pilots must train the way we fight. That's what we're doing with the F-16 in our continuing Red Flag combat exercises at Nellis AFB in Nevada."

Red Flag enables Air Force pilots to fly realistic combat missions in a Soviet threat environment. Certain pilots employ Russian flying tactics in mock dogfights so rival pilots may study and learn Soviet offensive and defensive techniques.

Over \$1 Million In Tuition Refunds Received

More than 2,000 General Dynamics employees from coast to coast took courses at local colleges, universities and vocational schools last year and received more than \$1 million in tuition refunds from the corporation.

On their own time and with company backing, the employees increased their job qualifications or pursued undergraduate or advanced academic degrees which related to their jobs.

"The tuition refund program at General Dynamics makes good sense for both the employee and the corporation," said Arch Rambeau, Staff Vice President, Personnel Relations. "In a time of rapid technological development, employees need to insure their skills and expertise do not fall behind and become obsolete. For the corporation, the program means insuring that in-house talent is current with the latest developments in a variety of fields."

Under the tuition refund program, in 1979 the corporation paid out \$1,162,331 for tuition costs of 2,327 employees who attended accredited colleges or universities or approved vocational schools. Courses of study eligible for the refund are limited to work-related subjects or degrees, and the refund is dependent upon successful completion of the program requirements. Employees interested in applying for tuition refund for 1980 should contact their Employee Benefits Office.

Oil Barges' Keels Laid At Quincy

Quincy Shipbuilding Division officially celebrated the keel-laying and beginning of construction of two oil barges for Bulkfleet Marine Corporation of Houston, Tex., on May 30th.

The barges, which are scheduled for delivery late this year, will be used by Bulkfleet for the transportation of refined petroleum products.

Participating in the keel-laying ceremony at the Quincy shipyard were J. Barry Snyder, President of Bulkfleet Marine; Peer Pedersen, Director of Bulkfleet Marine; James N. Brown, Manager of Chartering for Gulf Oil Co., and Gerald J. Mount, Vice President of Bulkfleet Marine. Each welded his initials on the keel units.

The barges will be 503 feet long with a beam of 84 feet and a depth of 42 feet. They have a capacity of 192,000 barrels of petroleum products.

Representing General Dynamics at the ceremonies were P. Takis Veliotis, Executive Vice President-Marine, and Joseph H. Lennox, General Manager of Quincy shipyard.

F-111s Display Readiness, Fly To England

Eighteen F-111D fighter-bombers from Cannon AFB, N.M., recently deployed to England as part of Operation Coronet Hammer, a simulated combat readiness exercise.

During the four-day operation, the Fort Worth-built swing-wing aircraft flew 109 sorties out of RAF Boscombe Down, southwest of London.

The number of missions flown considerably exceeds the 18-mission readiness rate established by the Air Force, and demonstrates the immediate availability of Cannon's 27th Tactical Wing to deploy to Europe.

Cannon's 18 F-111Ds flew non-stop to England in less than 10 hours, with in-flight refueling provided by KC-135 Stratotankers from Plattsburgh AFB, N.Y., and Pease AFB, N.H. - both home bases for Strategic Air Command FB-111A bombers.

Puerto Rico Buys Stromberg-Carlson Digital Equipment

A \$7.5 million contract for digital switching equipment was awarded to Stromberg-Carlson by the Puerto Rico Communications Authority (PRCA) which serves 12 exchanges in the network of the Commonwealth of Puerto Rico.

The contract will provide 26,541 lines of digital switching equipment to the PRCA, and it will be funded by a loan from the U.S. Rural Electrification Administration (REA). This contract is the largest ever funded by REA for central office equipment.

Four System Century Digital Central Offices (DCO) and 25 Digital Satellite Units (DSU) will be installed in central Puerto Rico beginning in 1981.

Each of the DSUs, connected to its host DCO, allows the PRCA to provide service to more subscribers without significantly increasing its investment in cable and other transmission facilities. The DSU is a cost-effective remote unit designed to transmit calls from an area to the DCO, using processors in the host office for all maintenance and switching.

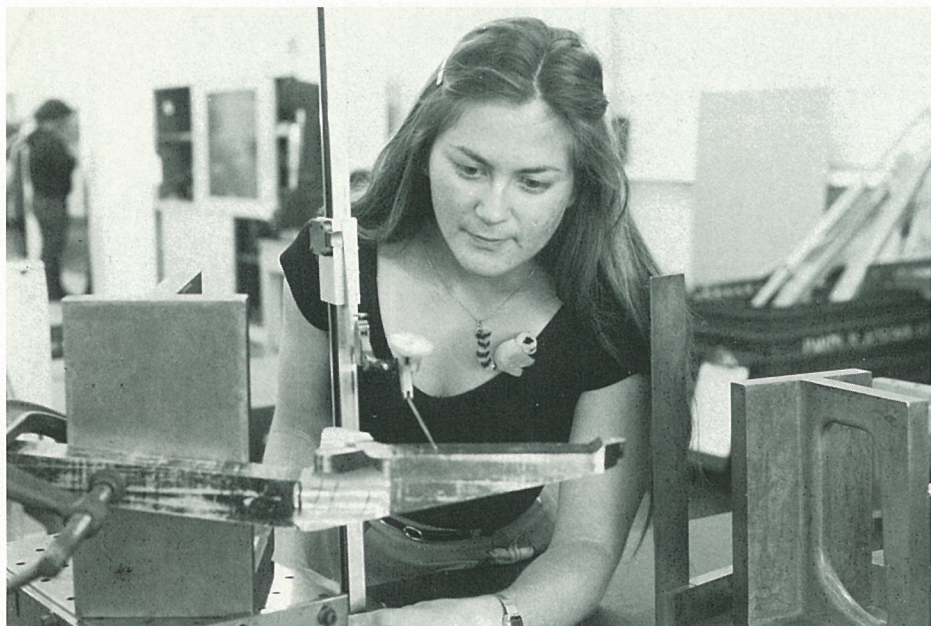
Many of the island's interior residents will have greatly improved telephone service as a result of this extensive communications network. In announcing the contract, Stromberg-Carlson's President Frederick F. Jenny said, "When these systems are installed, PRCA's customers will have the most modern telephone service available."

Savings And Stock Investment Values

Salaried	April 1978	April 1979	April 1980
Government Bonds	\$ 1.9886	\$ 2.1457	\$ 2.4067
Diversified Portfolio	1.2591	1.3844	1.6709
Fixed Income	—	—	1.0799**
Hourly			
Government Bonds	1.9879	2.1455	2.4047
Diversified Portfolio	1.2876	1.4162	1.7044
General Dynamics Stock	19.95*	31.00	67.75

*Reflects 2½ for 1 stock split

**New investment option July 1979



New Inspector. Kris Karleskint performs precision inspection of a machined part after graduating from the Convair apprenticeship program. She is the first woman to graduate from the program.

Convair Division Apprentices Are Graduated as Journeymen

Three Convair apprentices joined the journeyman ranks and two others were awarded scholarships in May during a Joint Apprenticeship Committee meeting and area graduation banquet.

Kris Karleskint, precision parts inspector; Guillermo Vargas, jig borer machinist, and Ron Penner, tool and die maker, received graduation certificates following completion of their four-year apprenticeship in their respective trades.

Steve Galloway and Richard Braeutigam, both apprentice machinists, were also recognized for being selected Case Kellogg Scholarship winners by the San Diego General Apprenticeship Committee. The \$300 scholarships are awarded to the outstanding apprentices in the San Diego area. Galloway and Braeutigam have perfect attendance records since starting their programs and both have high grade-point averages.

According to Wayne Turner, who ad-

ministers the apprenticeship program for Convair, Karleskint's training "involved all phases of inspection including many related areas such as machine shop, layout, numerical control programming and quality assurance engineering." She is also a Case Kellogg Scholarship winner.

Turner said that Penner is the first second generation apprentice to graduate. He is the son of Joe Penner who was graduated in 1949. The younger Penner's training involved the tooling trades such as loft, inspection, tool design, and planning. He is another Case Kellogg Scholarship winner from Convair.

Vargas began his apprenticeship training at Convair in 1975 and has now completed all requirements for his Associate in Science degree from San Diego Evening College. His program involved machine shop work and related areas such as numerical control programming, inspection and tool and die bend.

Convair Employees Cut Costs

First quarter results in Convair's Cost Reduction-Value Control program indicate the company's employees are finding more efficient and less expensive ways of doing their jobs.

During the first three months of 1980, Convair people saved the company an estimated \$23.7 million, or 75 percent more dollars than sought in an original

objective of \$13.5 million.

These figures recently were contained in a quarterly report released by Jake Ibarra, Program Administrator. The report also shows the employee suggestion portion of Convair's Cost Reduction program alone saved the company \$374,961 - a 25 percent improvement over a first quarter goal of \$300,000.

Convair Service Awards

40 Years

H. B. Bender, L. P. Birse, J. J. Medina, C. R. Powell, D. D. Strange, J. T. Jackson, G. Karel, F. N. Minter, V. C. Breit, H. T. Edwards Jr., J. B. Franklin, L. M. Guess, J. E. Mikol, J. F. Ridley, V. J. Berger, T. A. Bessey, T. W. Brotherton, J. W. Hoerger, H. E. Kobrich, F. E. Rockey, J. J. Beckman, W. J. Butts, D. V. Neece, V. G. Reid, C. E. Rice, V. T. Winsor, L. V. Wisniew.

35 Years

E. F. Arregui, M. R. McNeely, J. H. Slovacek, T. L. Wright, C. Andrade, L. F. Button, C. F. Marcello, C. A. Wilson, R. Casados, E. M. Stadheim, J. H. Bonner, H. A. Cowell, H. L. Evans, C. R. Jackman, J. R. McDonald Jr., J. E. Reynolds, N. L. Smith, E. L. Larson, C. D. Lindeneau.

30 Years

C. Allen, W. J. Beers, R. A. Goad, J. E. Parga, R. G. Wright, H. G. Bradley, L.

Castro, A. F. Polus, C. L. Hagen, M. P. Hess, K. Koba, J. Manzano, C. L. Vineyard, H. E. Vlachos, C. B. Wells, T. T. Austin, R. Davis, C. H. Fontaine, J. W. Hudson, L. M. Moore, J. E. Starling, F. I. Vannatter, V. C. Cardiel Jr., C. L. Cozzens, D. R. Davis, M. B. Glaser, F. Gomez Jr., R. J. La Madrid, A. H. Riffel, V. C. Somers, M. G. Sorcinelli, C. G. Woodward.

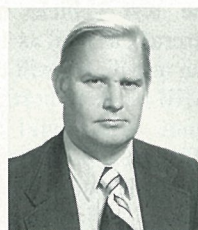
25 Years

J. R. Austin, R. H. Blumling, R. J. Bulinski, H. C. Cunningham Jr., C. P. Freeman, M. C. Groomer, P. K. Noland, R. L. Patrick, M. B. Rodriguez, M. E. Smith, L. F. Stephens, R. L. Swisher, E. F. Cooper, B. J. Hanzlik, L. E. Homer, J. K. Kramer, W. W. Nobienksy, U. C. Sammons, B. E. Smith, R. M. Brindle, C. F. Carpenter, A. J. Catalano, B. L. LeRoy, J. A. Lessing, A. Lopez, J. A. Maillet, S. A. McMillian, R. Miranda, R. E. Musterait, H. J. Quick, D. W. Sandberg, M. D. Schell, G. B. Wright, R. O. Benson, L. Board, R. F. Bucy, G. M. Carlson, J. J. Collins, R. E. Cree, W. B. Dawson, E. E. Dyer, P. R. Green, R. Hull, R. P. Krause, W. A. McGrew, R. W. Nelson, J. D. Peterson, R. G. Roscoe, P. W. Warner, A. T. Wells, E. R. Ford, L. V. Harris, C. W. Mattson, N. M. Morgan, S. Okamoto, F. S. Prowse, J. Roehl, D. A. Scott, H. Silva, R. E. Vazquez, D. C. Walker, L. H. Wilson.

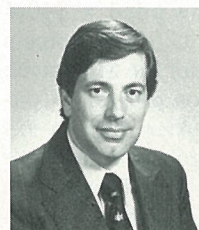
Buchanan Names W.C. Dietz To Head Missile Programs



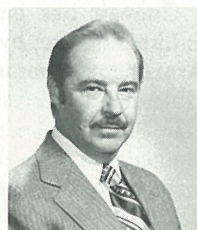
Dietz



Kuchta



Karam



MacKenzie

William C. Dietz has been named Vice President and Program Director-Cruise Missiles at Convair.

Dr. Leonard F. Buchanan, Corporate Vice President and Convair General Manager, said Dietz will have responsibility for all of the company's cruise missile programs - the Tomahawk sea-launched cruise missile for the U.S. Navy, the Tomahawk ground-launched cruise missile for the U.S. Air Force and the new medium range air-to-surface missile being developed for use by the Navy and Air Force.

Buchanan also announced that Bernard J. Kuchta has been named Deputy Program Director-Cruise Missiles and Dr. James T. Karam has been appointed Program Director for the medium range air-to-surface missile.

Ralph S. MacKenzie, formerly Convair Vice President and Program Director of the Tomahawk Cruise Missile program, has transferred to Pomona as Vice President and Program Director to lead the new RAM guided missile weapon system. The RAM system is now in engineering development at Pomona under contracts funded by the United States, the Federal Republic of Germany and Denmark.

Dietz has been with General Dynamics since 1940 and came to Convair in early 1979 from Fort Worth Division where he

was Vice President for F-16 Engineering. Prior to his new assignment, he was Vice President and Program Director for the air-launched cruise missile. He has a bachelor's degree in aeronautical engineering from the Aeronautical University in Chicago and was the recipient of the Reed Aeronautical Award of the American Institute of Aeronautics and Astronautics.

Kuchta joined Convair in June 1957 and was Deputy Director for Development of the air-launched cruise missile until named to his new post. He holds a Bachelor of Science degree in mechanical engineering from the New Jersey Institute of Technology and a Master of Science degree in aerospace engineering from San Diego State University where he is also an Associate Professor of Aerospace Engineering.

Karam came to General Dynamics in 1978 from the Defense Advanced Research Projects Agency. Prior to that, he had been Associate Professor of Aeronautical Engineering at the U.S. Air Force Institute of Technology. He holds a Bachelor of Science degree from the University of Arkansas, a Master of Science in aerospace from the Air Force Institute of Technology, and a doctorate from Purdue University. He has most recently been Director of Systems Engineering at Convair.



Award Winner. The Convair Recreation Association (CRA) captured four awards, including the best overall recreation program, from the National Industrial Recreation Association Conference. Displaying the honors which were presented in May are Steve Wooley, CRA Operations Manager (left), and Jerry Starkey, Convair Supervisor of Recreation. Two CRA publications - Make the Most of It and Dynamic Health - won awards, and The Kearny Mesa & Pacific miniature railroad at Missile Park was judged the "best individual activity within an overall program."



Silver Knight. Dr. Leonard F. Buchanan, Convair Division General Manager, receives the National Management Association's Silver Knight of Management Award at the Convair Management Association's dinner dance in May. Presenting the award on behalf of the NMA is Norm Rutherford (left), Manager of Art and Editorial.

GD World

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Convair Awarded Contract To Study Midcourse Guidance

Convair has been awarded a \$10.4 million contract by the U.S. Air Force's Armament Laboratory for the Midcourse Guidance Demonstration program. Convair Project Manager Alan Nelson explained that the research and development contract calls for the fabrication of three test vehicles and a series of flight tests to demonstrate the capabilities of different midcourse guidance systems.

The three test vehicles will be based on Convair's Tomahawk cruise missile, will be powered by a Teledyne CAE turbojet engine and will have a range of about 300 miles.

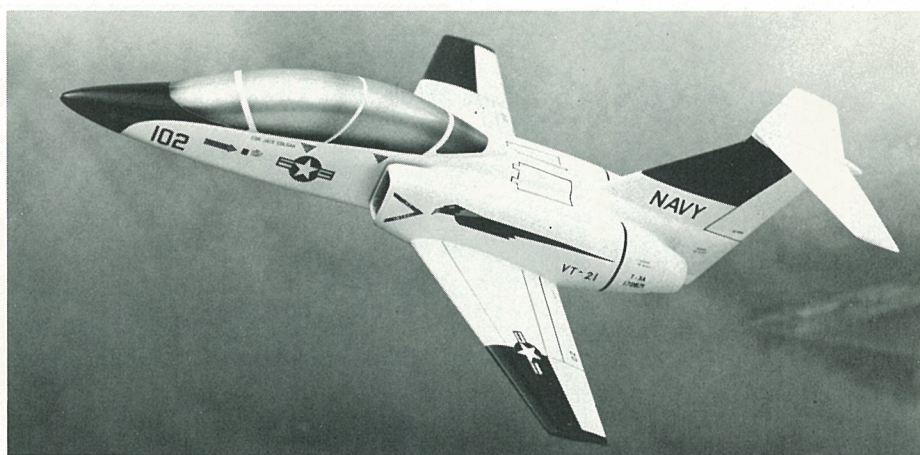
According to Nelson, three different guidance systems are scheduled to be tested—an unaided Tactical Guidance system, a Tactical TERCOM update system, and a Tactical Global Positioning Satellite update system.

Nelson says that the flight test program will begin in a little more than a year and will include about 40 captive flights with

the test vehicle mounted on an F-4 aircraft, as well as 18 free flights. Most of the test flights will take place at the Eglin AFB range in northern Florida, although some tests could also take place over White Sands Missile Range, N.M.

At the end of each free flight, the test vehicle will retract its wings and engine air scoop and will deploy a parachute recovery system for a soft landing. The three vehicles will be reused throughout the test program.

Convair has been actively involved in several previous studies for the Armament Laboratory and its parent Armament Division, including a concept study for an Advanced Conventional Standoff Missile, also managed by Nelson, and an advanced development contract for the Digital Integrating Subsystem, which is an integral part of the flying test bed for the Midcourse Guidance Demonstration that is under the direction of David Geyer.



Proposed Trainer. General Dynamics is proposing this aircraft to replace two aircraft presently used for Naval pilot training. The aircraft is an important component of a proposal by General Dynamics, American Airlines and Control Data to fulfill the Navy's VTXTS Undergraduate Jet Pilot Training System requirements.

GD Proposes Program For Naval Pilot Training

General Dynamics has teamed with American Airlines and Control Data to propose a new training program including a new jet trainer to fulfill the U.S. Navy's VTXTS Undergraduate Jet Pilot Training System requirements.

The program is designed to train nearly 600 pilots annually for the Navy's combat strike mission, to replace the two different aircraft now utilized for intermediate and advanced pilot training with a single, state-of-the-art jet trainer and to provide the Navy with a computerized training management system.

"Our program would provide improved training for more pilots with fewer instructor personnel than the system now in place and at a substantially lower cost to the Navy," said E. M. Petrushka, Fort Worth's Chief Project Engineer for Navy Programs.

"We anticipate that our program would save the Navy \$120 million a year in the

jet training system operating costs alone," said Petrushka.

Fort Worth Division would integrate the team effort and would produce 300 new Navy trainer aircraft.

American Airlines would develop the training syllabus for a 42-week undergraduate pilot training course and provide ground training equipment, including operational cockpit trainers and visual flight simulators.

Control Data would provide its PLATO computer-based instruction system to be integrated within the ground-based system. The PLATO training system is the largest and most comprehensive automated training system in the world. Control Data also will provide training management system hardware and software designed to General Dynamics' specifications. CDC's systems already are widely used by the U.S. Department of Defense.



Electronics Expansion. Some of more than 500 Electronics employees who were on hand during the groundbreaking ceremony for the new engineering facility listen to the program. In the foreground is a model of the new building.

Construction Now Under Way On New Electronics Building

More than 500 Electronics employees were on hand last month for a groundbreaking ceremony signaling construction start of an \$8 million engineering facility.

The two-story structure will contain 177,000 square feet of floor space on a six-acre site just north of the Electronics production building at the Kearny Mesa plant. Research and engineering personnel will occupy the new building when it is completed early next year.

"This new facility will allow us to focus and consolidate our engineering personnel in one area," said Frank Chesus, Electronics General Manager, during ceremonies attended by James M. Beggs, Corporate Executive Vice President-Aerospace, and key management representatives from Electronics.

Beggs commented that Electronics is "one of the youngest divisions in the corporate family" and said, "we are proud of what's been done here in a few short years."

"We think you have an enormous future and I challenge you to expand on the past, build on the future and grow four or five times as large as you are today," he said.

According to Chesus, the new facility will permit the division to update and expand the engineering laboratories to make them among the best in the industry.

"I feel confident," he said, "that this new environment will significantly assist our excellent engineering team in the accomplishment of their design and technology development objectives."

The building will be 510 feet long and have a reception lobby and a parking area for 800 cars. It is expected to be dedicated in the first quarter of 1981.



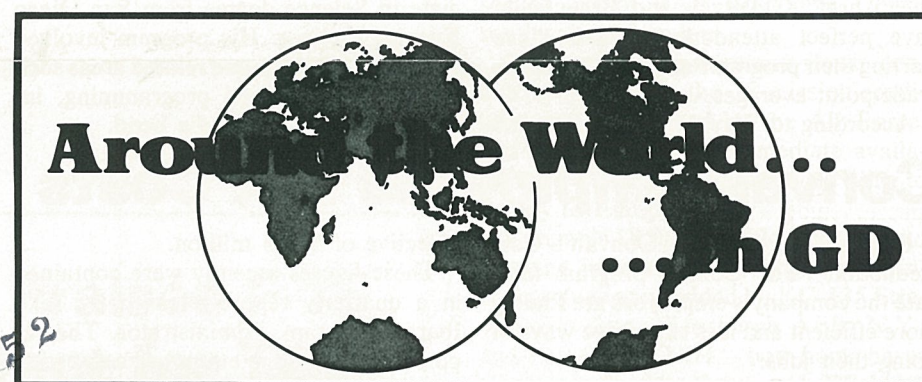
First Bite. James M. Beggs (left), Corporate Executive Vice President-Aerospace, and Frank Chesus, Electronics Division General Manager, break ground for the division's new \$8 million engineering facility at Kearny Mesa Plant.

Convair to Work On Space-Based Radar

Convair's Advanced Space Programs group has received a \$347,000 contract to design and test radar components for use in space.

Under the contract, Convair will build a 3 ft. x 3 ft. segment of the radar lens, or antenna. The radar would be placed in orbit by the Space Shuttle and, unfolded in space, would be approximately the size of a football field.

The radar is designed to provide all-weather coverage over wide areas of the globe, and is planned for operational use in the 1990s.



CHQ: Lester B. Hilliard joined as Corporate Manager Financial Planning-Commercial... John W. O'Leary joined as Senior Financial Analyst... Alvin E. Brown joined as Corporate Contract Analyst... Paul C. Hans joined as Corporate Business Development Manager-Commercial... Evelyn E. Chambers was promoted to Corporate Manager-Retirement Administration... Cynthia A. Croft joined as Senior Auditor-Administrator... Brian S. Nathanson was promoted to Subcontract Auditor... Thomas A. Brown was promoted to Manager-Internal Audit.

Fort Worth: Richard O. Roberts has been promoted to Assistant Project Engineer... Thomas E. Brents Jr. was promoted to Chief of Estimating... Robert L. Norment was promoted to Estimating Project Specialist... John E. Vick was promoted to Engineering Director... John K. Buckner was promoted to Engineering Director-Advanced Programs.

Electric Boat: Daniel W. Lamb transferred from St. Louis as Workers Compensation Supervisor.

Pomona: Scott K. Gordon was promoted to Group Engineer... Ronnie D. Abbott was promoted to Project Engineer... Kenneth N. Brown, Robert L. Hallse and Anthony Daukas were promoted to Section Head... John A. Thacker was promoted to Engineering Manager... James W. Annis, Max H. Elder, Alexander McMaster Jr., and Joe F. Mackey were promoted to Manager-Production Support... Dick Bulldock and Michael Oliveri were named Factory Manager.

Datagraphix: John D. Allison was promoted to National Service Manager.

Convair: Bruno W. Bracka and Erich W. Wolf were promoted to Engineering Manager... Daniel W. Henke was promoted to Group Engineer... Roy P. Poston, George Mavko and Robert P. Boriss were promoted to Engineering Chief... George G. Gigliotti transferred from St. Louis and was promoted to Manager-Financial Planning... James Greenwald transferred from St. Louis and was named Chief-Property Administration.

Freeman United Coal: Wayne Hankins was promoted to Superintendent-Orient No. 4 Mine.

GDSC: John H. Edwards transferred from Convair and was promoted to Manager-Contracts.

DSS: Dean M. DeMoss was promoted to Chief Engineering Software-CDSC... Thomas H. Murray was promoted to Chief-Data Systems-WDSC.

Stromberg-Carlson: J. V. Bergfeld was promoted to Supervisor Engineering Group I... Paul W. Freuck joined as Engineering Manager... Howard M. Magrab joined as Senior Staff Engineer... Eugen O. Rothacker was promoted to Engineering Supervisor.

GDCC: Bob Dorman was promoted to Western Area Operations Director... Ernie St. Germaine was named Product Marketing Manager.

Atlas/Centaur Picked To Boost 3 Intelsat V-As

The International Telecommunications Satellite Organization (Intelsat) has advised Convair that it has chosen Atlas/Centaur vehicles to launch the first three Intelsat V-A spacecraft.

Selection of Atlas/Centaur for these three satellites, scheduled for launching in 1984, will extend the life of the launch vehicle program at Convair into the mid-1980s, with a total value to the company of approximately \$90 million for fabrication, support and launch of the three vehicles.

C. E. Wilson, Convair Launch Vehicle Program Director, said, "We are delighted with the Intelsat action. This will continue the relationship between Atlas/Centaur and Intelsat which began with the launch of the first Intelsat IV satellite in January 1971."

Wilson said that until the recent action by Intelsat, it had appeared that the long and successful life of Atlas and Centaur might be ended by the Space Shuttle and its mission capabilities.

"Now that Atlas/Centaur will be available into the mid-1980s, other commercial and government customers can consider them for future missions," he said.

The Intelsat board also decided against using a Thor-Delta-class satellite for its domestic satellite service.

Instead, it will use its Intelsat V-A type spacecraft, which could mean a contract for an additional three to five launch vehicles from Convair. Procurement for these additional Atlas-Centaur vehicles could come by the end of 1980, with launches in 1985.

Atlas Selected To Launch Five DOD Satellites

Atlas space launch vehicles built by Convair have been selected to boost five satellites in the Defense Meteorological Satellite Program.

The Air Force Space Division has announced use of the Atlas to launch the Department of Defense environmental probes beginning next year. Value of the five new Atlas missions is about \$40 million.

Dr. L. F. Buchanan, Convair Division General Manager, said, "Selection of the Atlas by the Air Force for these important DOD missions confirms the confidence in the launch vehicle by our customers. Atlas, which began as a very advanced concept, continues to grow in capability by providing a cost-effective and reliable system for the Air Force and for the National Aeronautics and Space Administration."

EB Establishes Nuclear Services Department

Electric Boat Division, which has had more than 25 years' experience in nuclear propulsion, is now making its technical expertise available to the commercial nuclear power industry.

The shipyard has set up a Reactor Plant Services Department that is providing radiological engineering services and products to commercial nuclear power plants across the country.

The new department already has consulting contracts for nuclear power projects in six states. The projects are at Northeast Utilities' Connecticut Yankee Power Station in Haddam, Conn.; Three Mile Island Nuclear Power Station, Middletown, Pa.; Trojan Nuclear Power Station, Portland, Ore.; Power Authority, State of New York, Buchanan, N.Y.; Oyster Creek Generating Station, Forked River, N.J.; and Houston (Texas) Power and Light Co.

Products being offered include ventilation and containment systems and decontamination equipment.

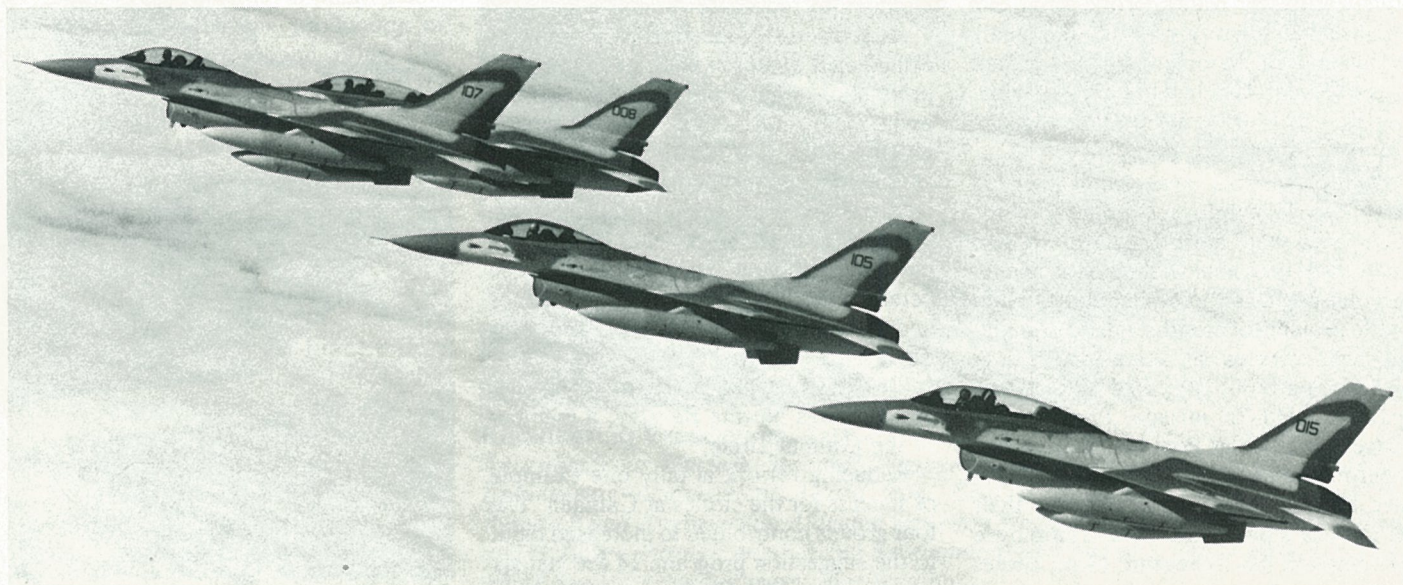
GD World

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July 1980

F-16s Delivered to Israeli Air Base



6,000-Mile Flight. Four F-16s (above), fly high over the Atlantic Ocean on the way to Israel on July 2d. Below, a U.S. Air Force pilot who ferried one of the aircraft to the Middle Eastern country is escorted by members of the Israeli Air Force.



Photo Courtesy I.P.P.A.

Flying non-stop from Pease AFB, N.H., to an airbase in Israel on July 2d, four USAF pilots delivered the first of 75 F-16s scheduled for operation by the Israeli Air Force.

The four Fort Worth-built multimission fighters touched down in Israel in late afternoon after a 6,000-mile, 11-hour flight over the Atlantic Ocean and Mediterranean Sea.

More than 5,000 persons were on hand to greet the aircraft, including cabinet ministers, members of the Israeli Parliament, military personnel, representatives of the U.S. Government and General Dynamics and invited guests.

After climbing from the aircraft, the four American pilots were applauded enthusiastically and received large bunches of flowers from women members of the Israeli Air Force (IAF).

Principal Israeli dignitaries at the arrival ceremonies were Deputy Prime Minister Igaal Yadin, standing in for the ailing Prime Minister Menachem Begin,

and Major General David Ivry, Commander of the Israeli Air Force.

General Ivry told the crowd that the addition of the F-16 was "another feather in the silver wing of the Air Force" and an extremely important addition to Israel's aerial might.

Representing the U.S. Government were Ambassador to Israel Samuel W. Lewis and U.S. Air Force Under Secretary Antonia H. Chayes.

Ambassador Lewis said that the flight from the United States demonstrated "the power the U.S. can project for its friends in the cause of peace anywhere on the globe" and America's unshakeable commitment to the Jewish state.

General Dynamics personnel at the ceremonies included: James M. Beggs, Executive Vice President-Aerospace; Paul T. Scanlan, Corporate Director International Marketing; Herbert F. Rogers, Fort Worth Deputy General Manager and Vice President F-16 International Programs, and Norman C.

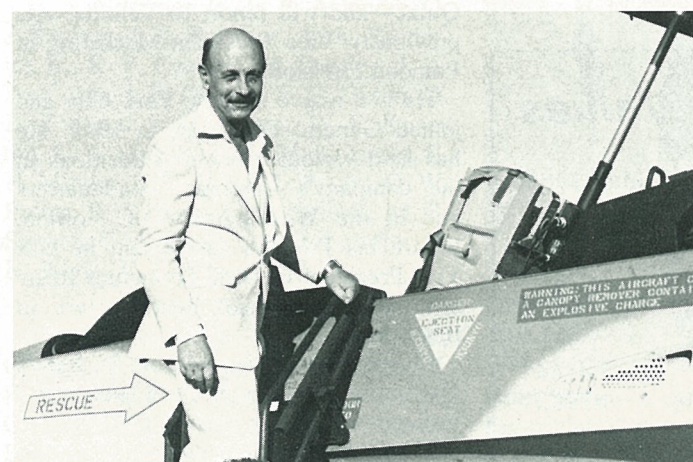
Stranberg, Director of the Middle East F-16 Program.

The four aircraft were refueled three times during the flight by U.S. Air Force KC-135 aerial tankers based in the U.S. and Europe. It was the longest flight yet made by F-16s, and included one night refueling over the Atlantic.

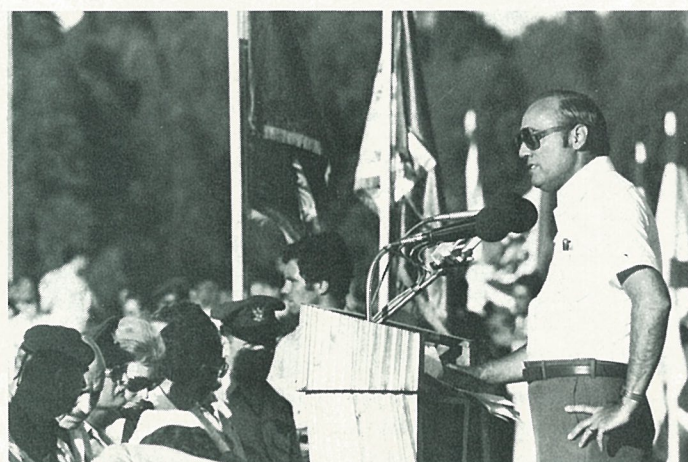
The aircraft landed in formation after a flyover of the air base and were taxied to a position in front of the speaker's platform for the welcoming ceremonies.

The American pilots who ferried the aircraft to Israel are assigned to the 388th Tactical Fighter Wing at Hill AFB, Utah. The aircraft arrived in Israel just 23 months after that country announced plans to procure a minimum of 75 of the versatile, high-performance fighters. Deliveries of these aircraft to Israel will be completed by the end of 1981.

Israel's first F-16s were turned over to the IAF earlier this year. Those aircraft were stationed at Hill AFB for training Israeli pilots and maintenance crews.



Met by Dignitaries. The first four Israeli F-16s to arrive in the Middle Eastern country were welcomed by Israeli Deputy



Photos Courtesy I.P.P.A. Ltd.

Prime Minister Igaal Yadin and U.S. Ambassador to Israel Samuel W. Lewis (right).

Pomona's Quality Circles Are Solving Department Problems

Names like The Incredible Gimbal Workers, Henspectors, Lucy's Lucky Ladies and Spirit of 52 might sound like titles of Walt Disney films, patriotic organizations or roller derby teams. But these names identify some of the small, but successful, problem-solving groups called Quality Circles that are participating in a new program at Pomona and Camden, Ark.

Quality Circles are groups ranging from 7 to 13 employees working in the same area who meet regularly to find solutions to problems in their department. Pomona began an experimental Quality Circle project six months ago by organizing four circles at Camden, which produces parts for Standard Missile, the Sparrow AIM-7F missile, Phalanx and Stinger; and two at Pomona. During this experimental period, all of the circles have contributed ideas to improve their department's performance, and employee participation has increased. More circles have been formed at the request of department managers at Pomona and Camden.

"The Quality Circles program provides employees an opportunity to improve their work situation by establishing stronger communication between line workers and managers," says Bonnie Hunt, Quality Circles Coordinating Facilitator at Pomona, who is heading the organization and operation of the program. "Some of our members are so involved in their projects that they come in on their own time to attend circle meetings."

One example of improved performance generated by Quality Circles is Camden's Incredible Gimbal Workers group in Department 914, where guidance sections for Sparrow missiles are assembled.

"In their first meetings, they identified time spent on rework as the biggest

problem in their area," says Paula Powell, Facilitator of the Camden program. "They invited inspectors to circle meetings for the purpose of finding methods to reduce rework."

After a series of meetings, a system was established in which each person on the production line charted every rework assignment and analyzed mistakes with an inspector. Cooperation between the assemblers and inspectors increased, and quality consciousness was raised. As a result, defects have been almost cut in half. In addition, the Quality Circle determined a need for additional lamps and tables in their work area and their request was granted.

"We have learned how to work together better," says Norma Beasley, a member of the Gimbal circle.

Reducing rework is only one example of success for the circles at Camden. The four groups contributed to increased input to the suggestion program. In the last six months, Quality Circle members have been responsible for one-fifth of the suggestions submitted.

At Pomona, the Spirit of 52 group, comprised of employees from the Department 52 paint shop, was responsible for implementing several cost savings plans, including the design of a rack that makes it easier to organize masking materials. Employees from the flex harness assembly area in Department 62 who are members of the 62 Pickup circle presented a detailed plan for redesigning the trim rooms in their area. The plan is currently being considered by Pomona's fabrication management team.

"The quality consciousness of these groups is obvious," says Jim Park, Manager of Process Quality Assurance and Corrective Action. "They are trying to prevent problems rather than merely find problems. They can be a great help to us."



Released to Army. Pomona's Division Air Defense gun system is ready for the U.S. Army's 90-day Development Test/Operational Test Evaluation at Fort Bliss, Tex.

Pomona's DIVAD Begins Army Testing at Fort Bliss

Two Division Air Defense (DIVAD) gun system prototypes developed by Pomona have completed contractor demonstration tests at Fort Bliss, Tex., and have been turned over to the U.S. Army for a 90-day development test/operational test evaluation.

During the month-long contractor demonstration tests, Pomona's DIVAD system destroyed five drone helicopter targets, one with just a single burst of gunfire. During the tests, the target drones were flown at various ranges, altitudes and speeds. Army crews operated the DIVAD during three of the tests.

The DIVAD gun system will provide mechanized units with an effective defense against attack by armed helicopters or high-performance fixed-wing aircraft. The development program on the system is being directed by the Army's Armament Research and Development Command.

Pomona's DIVAD gun system was

developed under a 29-month-long prototyping-for-production contract. It is in competition with one being developed by Ford Aerospace.

During the Army tests, the competing prototypes will be evaluated to determine their operational capability and performance. Following the tests and evaluation of production proposals, the Army will select one of the systems for production. The Army has indicated it plans to procure over 600 DIVAD units over the next five years.

During the three-month-long Army testing period, the gun systems will be operated by military crews against various aircraft targets in a variety of environments, including night operations. Testing will also include engagements against targets using electronic countermeasures.

Army evaluators will monitor all contractor-performed maintenance during the period.

Pomona's DIVAD gun system features twin Oerlikon KDA 35mm cannons and uses a radar fire control system derived from Phalanx, another Pomona-developed gun system now in production for the U.S. Navy. The Oerlikon gun and ammunition are widely used by North Atlantic Treaty Organization military forces.

Murphy Named To Marine Group Marketing Post

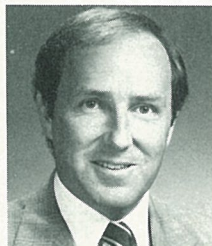
James J. Murphy has been appointed Vice President-Marketing for the Marine Group of General Dynamics.

P. Takis Veliotis, Executive Vice President-Marine, said Murphy will be responsible for coordinating the marketing activities of Quincy Shipbuilding and the Charleston (S.C.) facility, as well as for marketing commercial products and services of Electric Boat in Groton, Conn., Quonset Point, R.I., and Avenel, N.J.

Murphy, who will be headquartered at Quincy and will report to Veliotis, was previously Vice President-Marketing at Pomona Division.

He is a native of New York City and joined General Dynamics in 1969. He has held various marketing positions in the company's corporate headquarters and in the Washington, D.C., office. Before his Pomona assignment he was Vice President-General Dynamics International Corp., with headquarters in Brussels.

Murphy was graduated from St. John's University, Jamaica, N.Y., in 1960 with a bachelor's degree in history. He served in the U.S. Navy for nine years and earned a master's degree in management from the U.S. Naval Post-Graduate School, Monterey, Calif., in 1966.



Murphy

Mimbs to Head Pomona Marketing

Charles Mimbs has been appointed Vice President-Marketing for Pomona Division. In this position, he will be responsible for directing the division's domestic and international marketing activities.

Mimbs was formerly Corporate Director - Tactical Weapon Systems in the Washington, D.C., office.

Mimbs joined General Dynamics at Pomona in 1966 as a Group Engineer. In 1974, he was appointed Project Engineer with responsibility for the fire control system for the division's Standard ARM missile. He was transferred to the Washington office in 1976.

He was graduated from Mt. San Antonio College with an associate degree in science and engineering and earned a bachelor's degree in mathematics and engineering at California State University at Los Angeles.

He has been active in the National Management Association and in the national Junior Achievement program.



Mimbs



94 Express. Members of the newest Quality Circle to be formed at Pomona, the 94 Express, meet to discuss performance improvement in the silk screen area with Bonnie Hunt (right).

Savings And Stock Investment Values

	May 1978	May 1979	May 1980
Salaried			
Government Bonds	\$ 1.9961	\$ 2.1637	\$ 2.4587
Diversified Portfolio	1.2621	1.3689	1.7581
Fixed Income	--	--	1.0889**
Hourly			
Government Bonds	1.9929	2.1638	2.4564
Diversified Portfolio	1.2906	1.4004	1.7932
General Dynamics Stock	\$24.10*	\$28.87	\$63.25

*Reflects 2½ for 1 stock split **New Investment Option July 1979

DOD Okays Convair-Designed Production Control System

Convair has developed a system of management controls that has been officially accepted by the Department of Defense for company use on all major DOD production contracts.

The system, called Convair Integrated Management System II for Production, implements the requirements of the DOD Instruction on procurement contract management and shows both company and government contract management officials whether the company is meeting the various cost and scheduling criteria in the DOD Instruction.

Official notification of the acceptance was given to Dr. Leonard F. Buchanan, Convair General Manager, by Rear Adm. Walter M. Locke, Director of the Joint Cruise Missile Project, and represented acceptance of the system by the Naval Material Command (NMC), the Army Materiel Development and Readiness

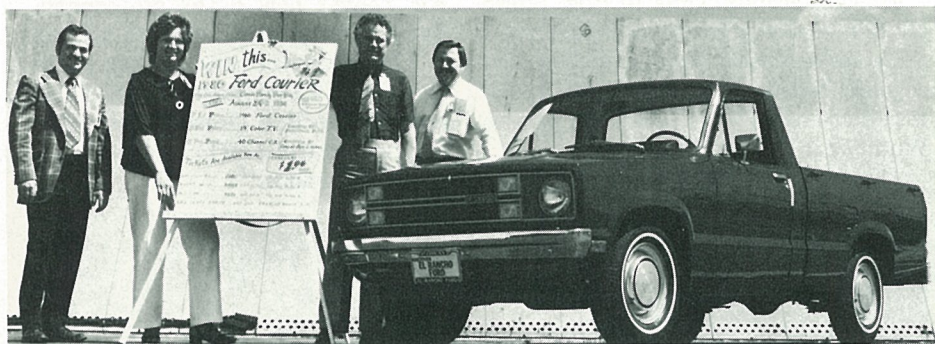
Command and the Air Force Systems Command, all major customers of the division.

The system received three separate reviews by DOD, the final in-plant review coming during pilot line production of cruise missiles last winter and spring. The control system applies to any major DOD contract for major acquisition, such as Tomahawk sea- and ground-launched cruise missiles.

Since the U.S. Navy is the primary buyer of the Tomahawk, the review was conducted by the Naval Material Command. Team Director was Dean Wall of NMC, with the on-site team headed by Capt. Tom Duguid, an Air Force officer assigned to the Joint Cruise Missiles Projects Office. Other members of the team represented the Navy, Air Force, Army, Defense Contract Audit Agency and the Defense Contract Administration Service.



Engineering Excellence. Seth Aldridge (right), Deputy Program Director of the Antisubmarine Warfare Standoff Weapon Program, receives Convair Division's Engineering Achievement Award from George Blackshaw, Vice President for Research and Engineering. Aldridge was cited for leading an engineering team from initial design through engineering development and test of a cruise missile system which met or exceeded every specification.



Picnic Prize. Grand prize at this year's Convair Family Fun Day is a new 1980 Ford Courier pickup truck. The picnic is sponsored by the Convair Management Association (CMA) and the Convair Recreation Association (CRA). Kicking off ticket sales are (left to right): CRA's Jerry Starkey, Jody Manuel and Bill Mears, and CMA President Norm Keith. The picnic will be held on Sunday, Aug. 24th, at Missile Park.

New Telephone System Planned For Some San Diego Operations

In early August, three General Dynamics operations in the San Diego area will change telephone systems.

On Aug. 4th, the operations located at San Diego's Lindbergh Field, Plant 19 and the Harbor Drive Facility will have their telephones switched over to the Centrex system that is now serving Electronics Division. The change will give the operations a Direct Inward Dialing (DID) capability and outside callers will no longer have to go through a central company switchboard.

Logistics Society Certifies Engineer

William Filipowski, a principal engineer at Electronics Division, has been presented the Society of Logistics Engineers' Certified Professional Logistician (CPL) Award. The award was presented by Gene Heizer, Electronics Vice President of Research and Engineering.

The CPL award, one of the highest in the logistics field, recognizes professional stature and ethics of logisticians within commercial industries and defense- and aerospace-related industries. Members of federal and local government agencies and academic institutions are also eligible to receive the award.

Filipowski is the first employee at Electronics to be recognized as a CPL and is one of only 309 people who have been certified to receive the international award.

Filipowski has been with Electronics for four years. He is also a member of the National Management Association.

However, those callers who do not know the extension of their party will still call the primary Convair Kearny Mesa number, and Convair operators will be able to switch the calls automatically to the new system. Tie-lines between divisions will still operate, with direct dialing from Kearny Mesa and other locations still possible.

According to Jim Martin, communications supervisor, the new arrangement is an interim system for the San Diego operations. He said General Dynamics Communications Company will study all the phone systems of the divisions and will make recommendations late this summer for long-range improvements in all company telephone systems.

Martin said that no new telephone arrangements will be accepted for the affected areas after July 3d until the cutover date of Aug. 4th, to permit installers to work with a stable system for the brief period.

Service Awards

40 Years

C. C. Baker, W. E. Barnett, A. O. Camp, J. E. Cassidy, D. D. Claxton.

30 Years

H. S. Alderman Jr., E. A. Ashmore, O. J. Bazoon, J. L. Bershaw, A. A. Broderick Jr., K. F. Cash, R. M. Darling, J. A. De Costa, J. B. Denton, F. C. Dixon, D. E. Evanson, L. G. Kamin, W. E. Knapton, U. J. Makela, C. L. McLaughlin, E. H. Minder, L. C. Nardi, L. P. Orr, O. W. Potter, R. R. Rote, G. E. Shields, M. S. Stepich, C. A. Stewart, D. E. Stouffer, R. E. Wells, F. C. Woods Jr.

25 Years

F. I. Backus Jr., W. R. Beverly, N. E. Cossano, J. A. Croft, W. E. Evans Jr., W. F. Herndon, J. E. Huys, R. L. Johnson, C. E. Kohler Jr., H. D. Kyler, K. C. Lejman, H. G. Mileur, K. F. Minegar, P. M. Nissley, J. L. Parr, W. K. Stillman 3d, F. M. Urban, D. L. Vockrodt, L. White, F. A. Wulf, G. H. Zoellner.

60 Electronics Supervisors Complete Training Course

Sixty Electronics Division supervisors recently completed a new management training course for front line supervisors. Top graduates were: Harlin Baldwin, Machine Shop; Bob Gregory, F-16 AIS Assembly; Roger Williamson, Maintenance; Orville Huffman, Launch Vehicle Programs; and Bob McKellips, Special Programs Assembly.

The new course was requested by Ken Lake, Division Vice President for Operations, and is designed to give newer supervisors an orientation in the basic elements of supervision and management of their technical operations teams.

The course was organized by Bill Hemmer, Operations Line Director, and Jim Damico, Administrator of Administration/Management Development. The 28 general sessions and 15 sessions of textbook review let the students apply textbook theory to actual experiences in personnel administration, such as attendance policy, grievance procedures and division business practices.

In addition to the improved management skills, each of the graduates also received eight hours of college credit for the company-sponsored training.

Prototype Beam Is Delivered For Building Space Structures

A prototype segment of a beam which may be used to build large structures in space has been delivered by Convair to the National Aeronautics and Space Administration (NASA).

The beam is made of a composite material consisting of graphite and a heat-sensitive plastic and was designed under a NASA contract from the Lyndon B. Johnson Space Center in Houston.

The prototype beam was formed by a company-developed automated extrusion and rolling process and joined by another company-developed process using ultrasonic welding techniques.

The project is part of a Large Space Structures Technology contract from the center. The next phase of the technology contract, which will be bid on next month, includes the design, manufacture and

evaluation of elements of a modular beam-builder capable of space operation. This could lead to assembly flight test of a beam-builder at some future date.

Dr. John C. Barrons Named Manager Of EEO Programs

Dr. John C. Barrons has been appointed Manager-Equal Employment Opportunity and Educational Programs at Convair.

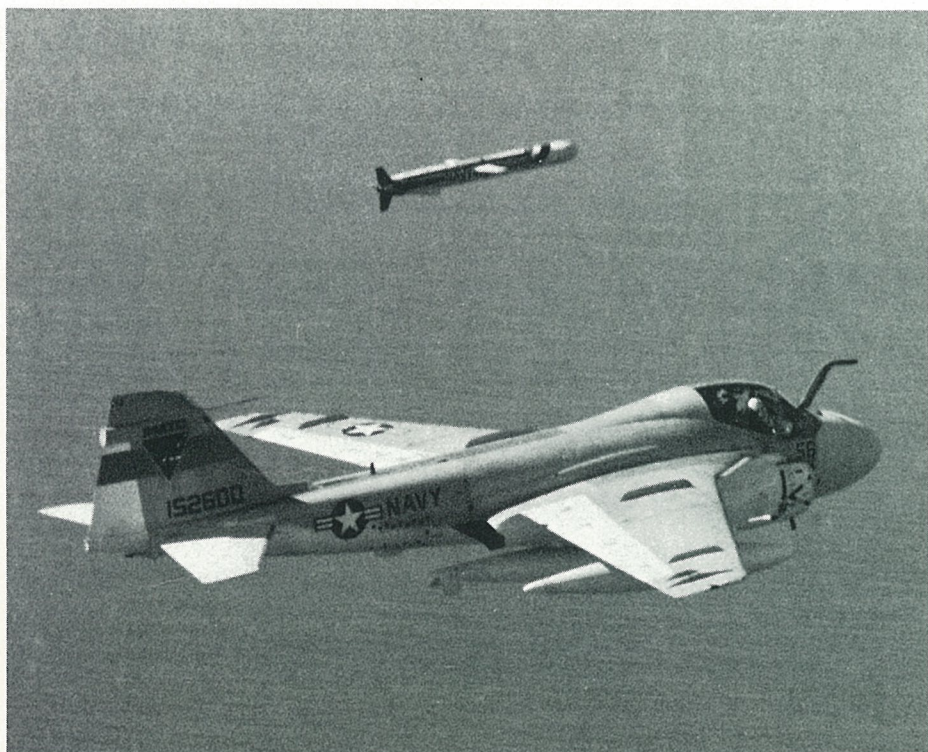
Dr. Barrons joins Convair from Bell Helicopter in Fort Worth, where he served as Manager of Training. Before joining Bell, he taught school in San Diego and subsequently served as Deputy Superintendent of the Grossmont Union High School District.



Cost Saver. L. M. Opper, a technical buyer at Electronics, is presented a \$1,604 Employee Suggestion Award by Frank O. Chesus, the division's General Manager. Opper recommended the elimination of special heat sensing devices on electric motors in F-16 Avionics Intermediate Shops because they were not needed. His idea saved the division \$16,049.20. On hand for the presentation were: E. R. Peters (left), Manager of General Procurement, and J. E. Clark, Purchasing Agent.

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G. Alexander Smith
Contributing Editors, Convair Edition
Jack Isabel, Charles Brown



Wing-to-Wing. A Convair Tomahawk cruise missile is accompanied on a test flight by a U.S. Navy A-6 carrying a Convair airborne test conductor who closely monitors the mission.

Engineers Fly Wing-to-Wing With Convair Cruise Missiles

"You're flying wing on a computer with a mind of its own..."

That's how one of Convair's airborne test conductors describes flying with a Tomahawk cruise missile. Every flight of a Tomahawk is accompanied by a company engineer flying in an airplane following the missile, watching its progress through the test.

The airborne test conductors ride in the right seat of specially equipped U.S. Navy A-6 aircraft with Navy pilots, and the A-6s follow the missile closely—from high altitudes to very low levels. The test conductors' constant voice reports to the Control Center help the entire test team follow the missile's flight.

They are part of the team of flight test engineers which monitors every flight of the San Diego-built Tomahawk. Normally two engineers are in the air, while others are in the Ground Control Center monitoring the missile through telemetered signals. Altitude, course, speed, fuel consumption, fuel pressure, oil pressure and course updates are a few of the vital signs that are checked on a moment-to-moment basis.

Howard Auten, who leads the engineers who fly with the test missiles, says that the airborne test conductor can take over control of the missile's flight, change its course or direct it to another altitude, if necessary, to keep the missile from flying off course.

Every one of the more than 50 flights has had different flight plans and test objectives. The airborne test conductors are in the mission planning from the start, and shortly before the actual test day, they study a simulation of the route described in the test plan, so that they are familiar with every turn and altitude change. By the time the missile is launched, they have plotted on their charts the altitude, probable speed and the probable position and attitude of the missile in relation to the ground. Thus, if something causes the missile to deviate from this plan, they know that it is happening and can be ready to take over control if needed.

"We do a lot of 'what-if' planning," Auten says. "By now, we have a pretty good idea of what the missile is likely to do in most circumstances, and a lot of our planning is spent getting ready to respond."

"We want to recover the missile after every flight," Auten says. "If the flight has been successful, we can use the missile again for another test. If something has gone wrong, we have a better chance of finding out the reason if we can actually look at and test the parts after recovery."

After each test, the airborne test conductor's post-flight report adds a visual impression to the study of the telemetry data to give engineers a complete picture of the flight. Motion picture and still photography of the launch, flight and recovery are also studied.

Energy Usage Cut by 8 Percent Throughout General Dynamics

General Dynamics reduced its use of energy 8 percent in 1979 compared to the year before under a corporate-wide program of energy conservation.

Every division and facility was affected by the program, as employees realized the necessity to turn off unneeded lights and machinery, as more efficient air conditioning and heating equipment was installed and as computers insured the most efficient use of heating and cooling equipment.

"Every General Dynamics employee can take pride in the fact that we lowered our energy consumption last year in spite of a substantial increase in business," said Jack H. Miller, Corporate Manager of Plant Engineering, who administers the energy conservation program. "Most of our locations have established programs to eliminate steam and air leaks, to reduce energy usage during peak periods and to monitor the use of heating, lighting and air conditioning. Those efforts have paid off."

Miller said the Abilene facility increased its production manhours by 40 percent during the year while energy use rose only 16 percent. At Convair, a very effective energy conservation program has produced an energy reduction of 27 percent per employee hours worked. At Electric Boat, the division as a whole reduced energy consumption by 8 percent while Quonset Point reduced energy usage by 17 percent.

Furthermore, Miller said, while the production activity at Fort Worth increased during 1979, energy consumption was decreased by 3 percent.

"Over the past few years, General Dynamics' efforts to reduce energy consumption have worked well. However, while our use of energy has declined, the cost of the energy we use has increased at a faster rate. The problem is not going to get any easier, and we all have to work harder on finding more solutions to our company's energy problem in the future," Miller said.

Four F-16s Deploy to Holland For Multinational Test Program

Four of the F-16 fighters assigned to the Multinational Operational Test and Evaluation (MOT&E) program recently made a 4,500-mile, 9.6-hour non-stop deployment from Hill AFB, Utah, to Leeuwarden Air Base in the Netherlands.

The MOT&E European evaluation will continue at Leeuwarden until August. Then the craft and related maintenance equipment will be moved to Skrydstrup Air Station in Denmark. In September, MOT&E will shift operations to Beauve-

chain, Belgium, and, in October, to Rygge Base in Norway. Testing will terminate in December.

Multinational testing was begun in January 1979 at Hill AFB, about the same time the first production model was flown from Edwards AFB, Calif., to the base. Some of the MOT&E testing is still being done at Hill although the bulk of the flying operations have now been moved to Europe.

First Belgian F.16 Thrilled Magazine By Soaring 1,000 Meters in 10 Minutes

The delivery of the first F.16 to the Belgian armed forces was not made in January 1979, but rather in July 1912, according to Jean A. Mangin who works in the Engineering Department of Fairey, Société Anonyme, a Belgian aerospace firm.

Mangin recently wrote to Fort Worth Division reporting his discovery in a 1912 magazine that four biplanes with pusher engines, called the Jero-Farman F.16s, were delivered to the Belgian army prior to World War I.

The delivery of the F.16s was reported

in the monthly magazine *La Vie Militaire*, which said the F.16 had demonstrated a top speed of 105 kilometers (65 miles) per hour and that one made a dash to an altitude of 1,000 meters (3,280 feet) in 10 minutes.

How times have changed. The Belgian Air Force's new F-16s are capable of flying at a top speed of 2,126 kilometers (1,321 miles) per hour and can reach an altitude of 1,000 meters in 6 seconds, according to Bob Drewry, Fort Worth's Engineering Chief for F-16 Aerodynamics and Performance.

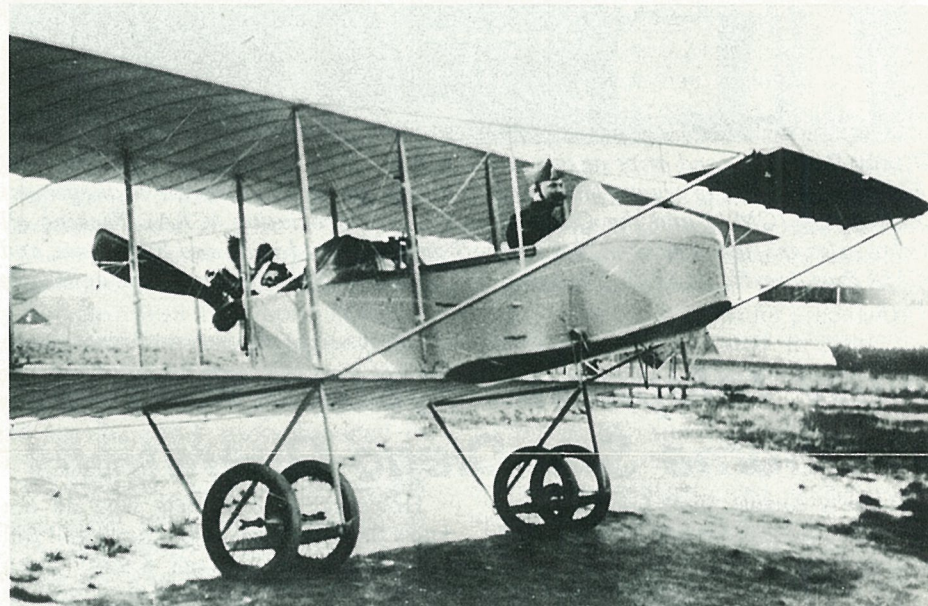


Photo Courtesy of Jean Maugin

The Jero-Farman F.16 in 1912

**Around the World...
...in GD**

CHQ: Louis A. Garrett was named Corporate Dayton Representative... Floyd Constant transferred from Pomona and was promoted to Corporate Manager-Air Launched Weapon Systems... Leonard H. Siennick was named Director of Graphics.

ATC: Timothy Kuhlman joined as manager of Cost Accounting.

Pomona: Richard L. Stuffer joined as Manager-Personnel Relations... John H. Whiteside joined as Manager-Labor Relations & Employment... Harry R. Bailey joined as Assistant Program Director-Viper Production... G. D. Goldshine transferred from Electronics as Experimental/Pre-Production Operations Director... Dick Bolduc was named Factory Manager.

Electronics: Calvin G. Franklin was promoted to Manager-Marketing.

Stromberg-Carlson: Paul W. Senory joined as Account Manager... Ove Villadsen joined as Director-Engineering... James A. McGrath was promoted to Manager, Marketing/Sales-Support... Arthur M. Thompson joined as Manager, Sales-Mediterranean... Frank J. Devine was promoted to Manager, Regional Sales-Midwest... Ian J. Mitchell was promoted to Mid-Eastern District Sales Manager... Robert D. Francis was promoted to Director of Sales-International Business Development.

Convair: Walter S. Becker and Richard M. Bloom were promoted to Engineering Manager... David L. Browning was promoted to Engineering Chief... Richard G. Huntington was promoted to Engineering Director-Conventional Cruise Missile... Gerald M. Huston transferred from St. Louis as Program Manager... Harold R. McCaslin transferred from Fort Worth and was promoted to Manager-Estimating.

Fort Worth: Curtis O. Grantham joined as Senior Contracts Administrator.

GD Earnings At New High For 2d Quarter

On August 7th, General Dynamics announced that its earnings for the second quarter of 1980 were \$54.4 million, or \$2.01 per share, a new high for the period. This was up 14 percent from 1979's record second quarter earnings of \$47.8 million, or \$1.77 per share.

Earnings for the first half of 1980 were a record \$90.7 million, or \$3.34 per share, compared to the \$77.3 million, or \$2.85 per share, reported in the first six months of 1979.

Sales for the quarter and first half of 1980 were \$1.18 billion and \$2.25 billion, respectively, compared with \$1.02 billion and \$1.91 billion reported for the same periods last year.

The 1980 second quarter earnings included an investment tax credit of \$4.7 million, or 18 cents per share, attributable to the delivery of the liquefied natural gas (LNG) tanker *Lake Charles* to Lachmar, a partnership organized by General Dynamics, Panhandle Eastern Pipe Line Company and Moore McCormack Resources to transport LNG from Algeria to the U.S. Gulf Coast.

"Earnings increases in the aerospace divisions, Electric Boat and Material Service are reflected in the second quarter results," said David S. Lewis, Chairman and Chief Executive Officer. "However, this strong performance was offset partially by reduced sales and earnings in some of our telecommunications and natural resources operations resulting from the downturn in the U.S. economy and by an extended strike that curtailed operations at our Canadian subsidiary, Asbestos Corporation Limited."

Commercial Results Mixed

Stromberg-Carlson and American Telecommunications showed reduced sales and earnings in the quarter compared with 1979, while General Dynamics Communications, the company's telephone interconnect subsidiary, and DatagraphiX, the leader in the computer-output-microfilm industry, showed improved results compared to last year.

Three of the resources subsidiaries - Marblehead Lime, Freeman United Coal and Asbestos Corporation Limited (ACL) - showed reduced sales and earnings for the quarter compared to the same period last year, but Freeman United's sales and earnings for the 1980 first half were improved.

The lower production levels in the steel industry, Marblehead Lime's principal customer, had a severe impact on Marblehead Lime's second quarter results. The combination of a 12-week strike at ACL's Quebec operations, which extended until the end of May, and continuing unsettled worldwide market conditions for asbestos seriously depressed quarterly results at the Canadian subsidiary.

200th F-16 Delivered

In July, Fort Worth delivered the 200th F-16 of the nearly 2,000 currently planned for production over the next several years.

"These aircraft are being produced on-cost, on-schedule and with very high quality," Lewis said. "In addition, productivity gains continue as a result of our ongoing modernization program at Fort Worth."

The F-16 is a finalist in the current competitions in Australia and Spain for selection of a new fighter for their Air Forces. Decisions in these competitions are expected late this year or early next year.

Sales and earnings at Pomona were improved over last year as a result of stepped-up production on a number of tactical missile and gun systems.

Pomona delivered the two prototypes of its Division Air Defense (DIVAD) gun system to the U.S. Army in June for extensive test and evaluation. The Pomona DIVAD is in competition with a

Continued on Page 2

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August 1980



Salute to a Falcon. The U.S. Air Force Academy falcon was on hand at Hill AFB, Utah, with its handler, Cadet 2d Class (Junior) Jeffrey A. Hosken, during ceremonies in which the F-16 was officially named the Fighting Falcon.

F-16 Named 'Fighting Falcon' by U.S. Air Force

More than 2,000 people turned out on the sun-drenched flight line at Hill AFB, Utah, last month for ceremonies in which the U.S. Air Force's latest fighter, the F-16, was named the "Fighting Falcon."

The enthusiastic crowd of military personnel and civilian officials were also treated to a demonstration of the aircraft in flight including a vertical streak maneuver, in which an F-16 soared straight up until it was out of sight.

Officiating at the ceremony was Lt.

100th System Century DCO Placed in Service By Stromberg-Carlson

The 100th Stromberg-Carlson System Century digital central office has been placed in service for the Western Reserve Telephone Co. at Aurora, Ohio. Western Reserve, based in Hudson, Ohio, is an operating company of Mid-Continent Telephone Corp., the fifth largest independent telephone operating group in the United States.

The 1,000-line digital central office (DCO) at Aurora is colocated with an existing Stromberg-Carlson XY central office. Local community traffic will continue to be routed through the XY switch, and all long distance and new customers will be served by the new system. Customers served by the DCO now will have such features as call forwarding, call waiting, three-way calling and speed calling.

Mid-Continent believes the colocation of the XY switch with the DCO system is an efficient way to expand telephone service, and has plans to complete modernization of its service by gradually adding more digital equipment.

Stromberg-Carlson produced the first Class 5 DCO in this country. It was placed in service in July 1977 at Richmond Hill, Ga., for Coastal Utilities, Inc.

In January 1978, the Rural Electrification Administration (REA) accepted the DCO based on its performance at Richmond Hill. The acceptance paved the way for rapid introduction of the DCO by independent telephone companies seeking REA financing to update and improve their equipment.

Stromberg-Carlson's DCO systems have received wide customer acceptance, and more than 250 systems are currently on order.

Gen. William R. Nelson, Commander of the 12th Air Force, who said, "The selection of the name Fighting Falcon followed a lengthy search during which suggestions were solicited from throughout the Air Force."

"We wanted a name that would reflect the F-16's power, strength, ability and versatility," he said, "... a name that would reflect the pride of the men and women who fly and maintain it."

During the ceremonies, a design of a

Fighting Falcon, which had been hand-painted on the F-16's fuselage by Salt Lake City artists Matthew and Mark Waki, was unveiled. The design had a falcon against a blue shield holding two bolts of lightning in its talons - one bolt was for the F-16's air-to-air role, the other was for its air-to-surface role.

On hand for the christening was a real falcon from the U.S. Air Force Academy with its handler, Cadet 2d Class (Junior) Jeffrey A. Hosken.

Two Phalanx Gun Systems Installed on U.S. Navy Cruiser

The USS *Biddle* became the first U.S. Navy cruiser to be armed with Pomona's new Phalanx radar-controlled gun when two units of the antiship missile defense system were recently installed on the ship at the Philadelphia Naval Shipyard.

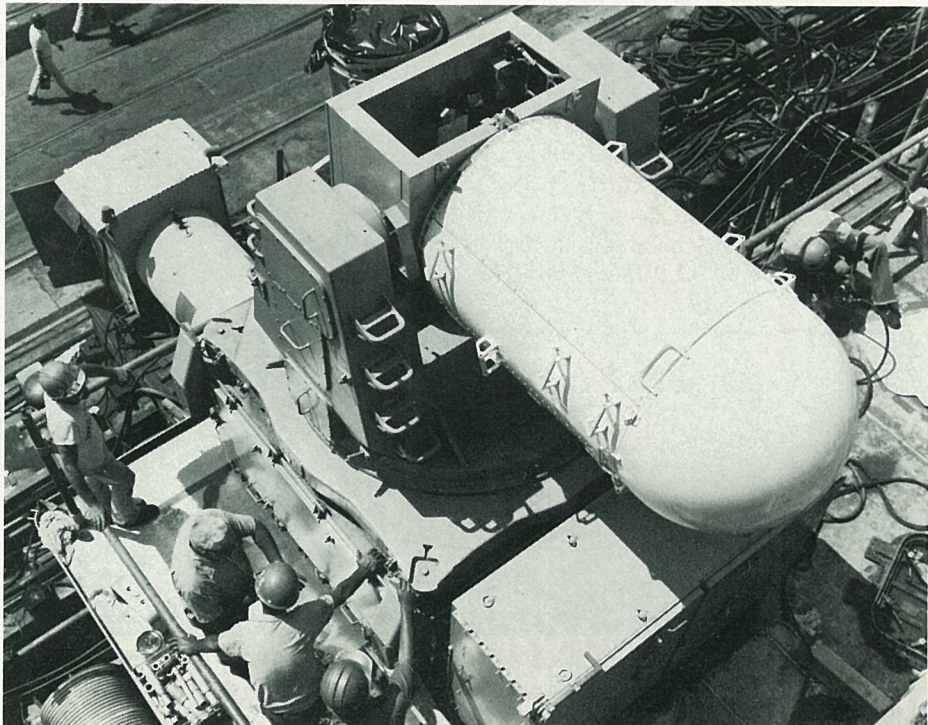
Earlier this year, two aircraft carriers, the USS *America* and the USS *Enterprise*, each received three Phalanx systems. Single units of Phalanx have also been installed at Navy training centers at Virginia Beach (Dam Neck), Va.; Great Lakes, Ill., and San Diego, Calif.

The Navy has said it plans to place Phalanx on over 240 ships ranging from patrol boats to carriers. The system is designed to protect ships against sea-

skimming missiles that penetrate the fleet's outer defenses.

Built by Pomona Division, Phalanx can be installed aboard ship within one to two days following installation of the foundation and pulling of cables between the system and its control panels. Self-contained, it needs only a 440-volt connection and a hookup to sea water for cooling.

The gun system's unique defensive capability is based on closed-loop spotting, a breakthrough in radar technology. This technique uses advanced radar and computer technology to pinpoint targets and automatically and continuously direct 20mm projectiles onto the targets.



Pomona's Phalanx is installed on the USS Biddle

GD Earnings At New High For 2d Quarter

Continued from Page 1

DIVAD developed by Ford Aerospace, and early next year the Army will select one for a planned long-run production program.

Convair's space-launch vehicle programs received a significant boost when the Atlas/Centaur was selected to launch three commercial communications satellites for the International Telecommunications Satellite Organization in 1984, and the Atlas was chosen to launch five meteorological satellites for the Department of Defense. The total value of these contracts is over \$130 million.

Lewis said the new Intelsat order will extend Atlas/Centaur production into the mid-1980s, increasing the likelihood that other potential users will select these dependable boosters for future missions.

Lewis attributed the improved sales and earnings at Electric Boat to increased activity on the Trident ballistic missile submarines. The division has launched two of the giant ships and work is under way on the five others currently under contract.

Lewis said in September Quincy Shipbuilding will deliver the 10th and last of the liquefied natural gas tankers which have been under contract at the shipyard.

"We are continuing our very determined efforts to secure new business for the shipyard and have been successful in obtaining some commercial and Navy work which will help retain the nucleus of the Quincy shipbuilding team until orders for more LNG ships or other major ship construction programs are received," Lewis said.

"On balance, we believe the company's performance in the first half of 1980 was reasonably good," Lewis said. "Although certain of our commercial operations are being affected by the downturn in the U.S. economy, our government operations are showing substantial strength, which should enable the company to continue to progress in the months ahead."

Scholarship Tests Scheduled for Fall

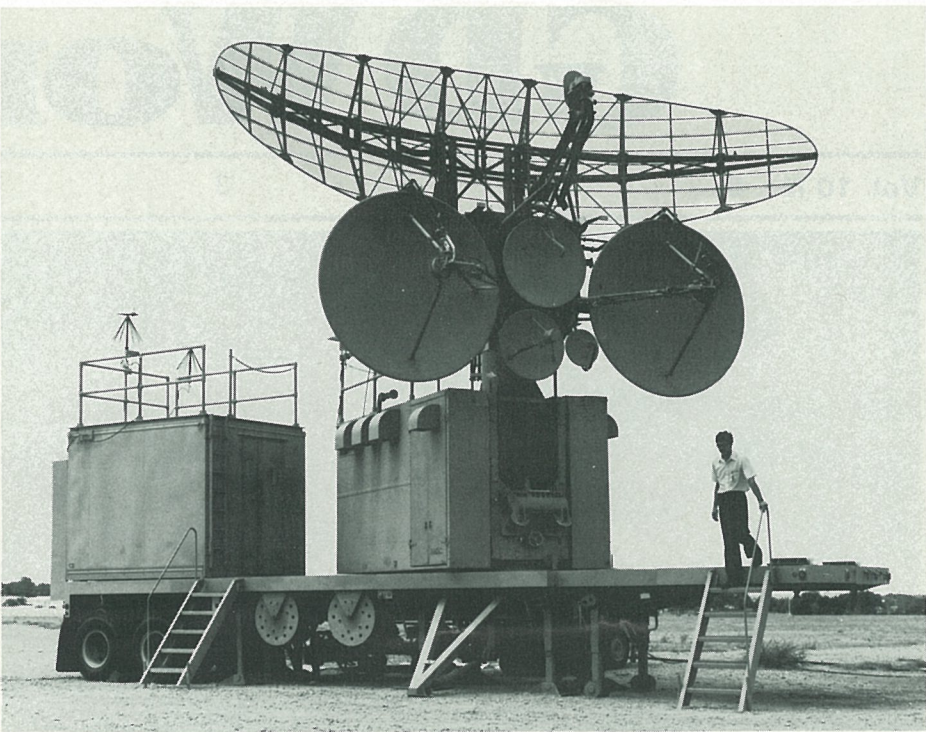
Sons and daughters of General Dynamics employees who plan to enter college in 1982 and who would like to compete for a General Dynamics Merit Scholarship should take a preliminary test this fall.

Each year, General Dynamics sponsors four college scholarships in cooperation with the National Merit Scholarship Corp. (NMSC). The scholarships, which cover four years, can provide up to \$3,000 per year to the student.

Students who plan to enter college in 1982 should take the Preliminary Scholastic Aptitude Test/National Merit Scholarship Qualifying Test that will be administered Oct. 21st or Oct. 25th at high schools across the country.

The highest scorers in each of the 50 states will become NMSC semifinalists. The following fall, the semifinalists must take the Scholastic Aptitude Test of the College Entrance Examination Board and have their scores sent to NMSC.

Further information about the General Dynamics Merit Scholarship Program may be obtained at GD Industrial Relations offices.



Sixty-in-One. Fort Worth's Multiple Threat Emitter Simulator uses 19 transmitters that produce 60 computer-controlled signals that mimic emissions of surface-to-air radars, antiaircraft artillery radars, early warning and acquisition radars and airborne intercept radars.

Fort Worth's MUTES Trains Aircrews In Electronic Warfare

U.S. and allied aircrews are constantly training to perfect their flying and navigational skills. They must also learn how to use their electronic warfare (EW) equipment which detects and defeats hostile radars, surface-to-air missile guidance systems and antiaircraft aiming equipment.

In training its aircrews, the Air Force uses Fort Worth-built simulators to mimic the air defense equipment of Soviet forces. With the simulators, aircrews learn how to defeat the threats with their aircrafts' electronic countermeasures (ECM) equipment.

One of the latest simulators, Fort Worth's Multiple Threat Emitter Simulator (MUTES), is able to duplicate several Soviet radars at the same time.

Under the control of computers, the trailer mounted MUTES can simulate one type of threat, then rapidly switch to another. It has 19 transmitters which can cover frequencies that range from 800 million cycles per second to 15 billion cycles per second. All of the important radar transmission recognition features are copied—frequency, pulse repetition frequency, pulse width and antenna scan rates.

"MUTES allows aircrews to practice using their electronic warfare hardware under realistic training conditions," says Bob McLendon, Fort Worth's MUTES Program Manager. "Aircrews can also make evaluations and check the performance of their EW equipment to see if it is working properly."

Fort Worth has been involved in the production and testing of airborne EW systems since 1958 when the division built a simulation laboratory for the ECM system used on the B-58 Hustler, the world's first supersonic bomber.

Since then, the division has become a major EW laboratory for the Air Force in which airborne ECM equipment is evaluated.

In addition, Fort Worth has produced more than 30 threat radar simulators for the Air Force which have been used on test and training ranges to train aircrews.

Speaking about the threat simulators,

McLendon says, "Aircrews flying practice missions against this equipment gain vital experience in how to use their ECM systems. They gain realistic experience that they would otherwise have to receive in actual combat."

GLCM Launch Control Center Takes Shape at GTE Sylvania

The preproduction prototype of the Launch Control Center to be used in the Tomahawk Ground-Launched Cruise Missile (GLCM) system is now under construction at Convair's subcontractor, GTE Sylvania in Waltham, Mass.

When completed, the Launch Control Center will consist of a hardened truck-mounted shelter that will house the two missile launch officers along with the communications and electronics equipment necessary for command and control

F-16's Combat Capabilities Demonstrated

The combat capability of the F-16 Fighting Falcon was proved for a second time during a five-day exercise conducted by the 388th Tactical Fighter Wing at Hill AFB, Utah, in late June.

Named Yellow Max Alpha, the test served as an evaluation of the ability of the 4th Tactical Fighter Squadron to prepare 18 aircraft and 6 spares to fly in combat operations.

Following the initial deployment phase, maintenance personnel configured six F-16s for combat within an hour.

During the simulated combat, aircrews flew both air-to-air and air-to-ground missions over five ranges in Utah, Nevada, and Idaho.

At the conclusion of the readiness exercise, the unit had surpassed all established goals. On the final day, 72 sorties were flown using 18 aircraft. Over the three-day period of flying, 240 sorties were recorded.

In late March, F-16s from Hill made a record nonstop flight during a three-day exercise named Red Max Alpha. During that exercise, F-16s flew a 4,350-mile route and then participated in two days of simulated close air support and interdiction missions.

of the missiles. A typical U.S. Air Force GLCM unit will consist of two Launch Control Centers and four missile-carrying Transporter Erector Launchers (TELs) capable of firing 16 Tomahawk cruise missiles.

Plans call for Sylvania to deliver the first preproduction prototype Launch Control Center later this year, which will be used in a second GLCM test flight early in 1981.

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Around the World...

...in GD

CHQ: Edward E. Douville Jr. transferred from Pomona and was promoted to Corporate-Marketing Manager-Middle East (Israel) . . . Hideki Hamamoto transferred from Pomona and was promoted to Corporate Director-Tactical Weapon Systems in Washington, D.C. . . . Raymond E. Kozen transferred from Convair and was promoted to Corporate Director-Cruise Missile Systems . . . Edward R. Jayne 2d joined as Corporate Director-Aerospace Planning and Operations Analysis.

Convair: George D. Carroll was promoted to Superintendent . . . R. Sanchez transferred from Fort Worth and was named Manager of Quality Assurance.

Electronics: Joe E. Alcalá was promoted to Director-Mechanical Design . . . C. Keith Anderson was promoted to Director-Advanced Programs . . . James P. Collins was promoted to Director-Marketing . . . J. G. Garcia was named Program Manager-ACMI.

Electric Boat: John W. Hall Jr. was promoted to Deputy Director-Facilities . . . Robert V. Pierce was promoted to Director-Quality Assurance . . . Jeffrey C. Pritchard was promoted to Manager-Quality Assurance Inspection . . . Francis A. Tubeck was promoted to Deputy Director-Quality Assurance.

Fort Worth: Carl S. Drostie was promoted to Engineering Manager-Flight Control Systems . . . Wesley M. Crocheron transferred from St. Louis and was promoted to Marketing Manager.

GDCC: Roger L. Davy and Wayne A. Newman joined as Area Systems Engineer.

Freeman United: James R. Stull was promoted to Superintendent-Buckheart Mine . . . Marvin D. Hall was promoted to Assistant Superintendent-Buckheart Mine . . . Paul W. Richter was promoted to Mine Manager-Buckheart Mine.

Stromberg-Carlson: Ronald A. Bursleson joined as District Sales Manager-Caribbean.

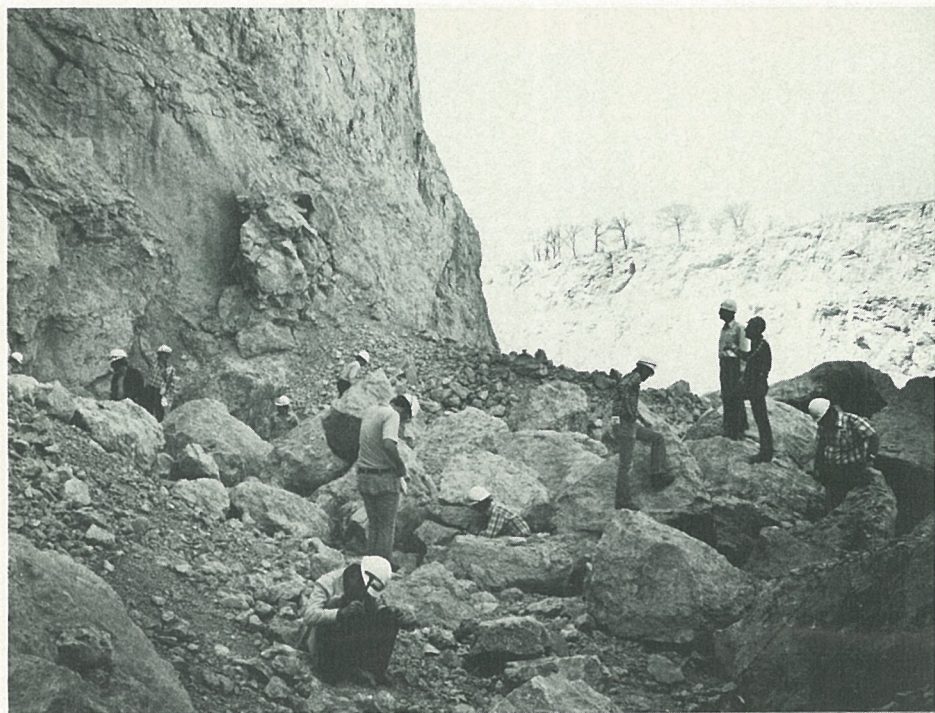
Material Service: Edward K. Wilverding was promoted to Director-Personnel.

DSS: E. L. Leith was named Data Systems Specialist-CDSC . . . Joseph A. Robinson joined WDSC as Purchasing Agent.

Savings And Stock Investment Values

	June 1978	June 1979	June 1980
Salaried			
Government Bonds	\$ 2.0048	\$ 2.1830	\$ 2.4811
Diversified Portfolio	1.2700	1.4280	1.8048
Fixed Income	--	1.0000	1.0980
Hourly			
Government Bonds	2.0040	2.1832	2.4790
Diversified Portfolio	1.2987	1.4608	1.8413
General Dynamics Stock	\$30.64*	\$32.25	\$66.125

*Reflects 2½ for 1 stock split



Geologists Study Rock Formations

Photos by Brenda Garcia

Company's Thornton Quarry Is Classroom for Geologists

By Betsy Orkild

"So what's the big deal? It's just a bunch of old rocks!" cried a red-haired Cub Scout who stood defiantly with his hands on his hips looking down into Material Service's Thornton Quarry south of Chicago.

"Hush," hissed his den mother, as she frantically gathered her scouts around her. But it was too late; a large, husky man wearing a plaid shirt and a condescending smile had overheard the boy's comment and was walking toward the group.

"It is a big deal, young man," said the stranger, who happened to be a geologist from Indiana.

The den mother began to bubble with apologies, but the geologist quieted her with an authoritative wave of his hand.

"No need to apologize," he said. His voice rumbled like a glacial landslide. Twenty Cub Scouts' faces turned toward him in awe. The red-haired boy was secretly convinced he was Paul Bunyan.

"I'm going to tell you all a story," the geologist said, crossing his arms over his chest. "Four hundred million years ago, that's two hundred million years before dinosaurs began rambling around the earth, this whole area here," and the boys watched his hand move in a giant arc, "this whole area and most of Illinois and Indiana and Michigan was a land of perpetual summer.

"A warm tropical sea covered Chicago. Just like in the South Pacific today, the sea swarmed with life. You could have looked down through the clear water and seen brightly colored tentacles gently waving from the coral wall. There were

sea lilies and lampshells and insect-like trilobites scurrying around the ocean bottom. These small sea animals died, and their bodies heaped up on the ocean floor. Over millions of years, their remains became compressed into limestone.

"The sea dried up, the glaciers moved in and the coral reefs were buried deep beneath the earth's surface all over the Midwest. Most of these reefs contain oil and gas deposits. Unfortunately, all the petroleum here at Thornton evaporated into the air long before man could invent a use for it."

"So what's this place good for then?" asked the red-haired boy.

The geologist smiled patiently. "For rocks and research," he said. "Do you realize this quarry produces stone ranging in size from 10-ton boulders to lime ground as fine as flour? I guess they use it to make toothpaste."

"Yuk," said the red-haired boy.

"But as far as I'm concerned, limestone is not Thornton's most valuable product. The most important commodity the quarry has to offer is knowledge—knowledge of the past. You may not realize it, but this gigantic hole in the ground is the largest and most famous limestone quarry in the world. For nearly half a century geologists from around the world have been coming here to study its fossils and sedimentary structures.

"In fact, just recently, Dr. John Hurst, a geologist from the Denmark-Greenland Geological Survey, visited Thornton. He's been up in Greenland studying Silurian Age reefs—like the one you're standing on now; he traveled thousands of miles to see Thornton.

"Oil companies send their geologists and petroleum engineers to Thornton to study the structure of the reef, which helps them in exploring and drilling for oil. This reef-turned-quarry gives us an excellent idea of how reefs develop, because it is the one place in the world where an ancient coral reef is laid bare for close examination. There's a fossil in every rock you pick up. In fact, some fossils from here have ended up in museums around the world."

He picked up a rock and cradling it in his giant palm, said emphatically, "If you've got stone from Thornton in your driveway, you can go fossil hunting in your own front yard."

"So why are we here then?" mumbled the red-haired boy.

With a frustrated sigh and a flick of his thick wrist, the geologist tossed the rock to the boy. The boy caught it and, after examining it closely, exclaimed, "Hey! There's a snail stuck in here!"

"I told you so," said the geologist as he turned and walked away.

"Who was that stranger?" asked the den mother, watching his broad back disappear behind a boulder.

"That," said the red-haired boy, "was the stone ranger."



Scouts Collect Fossils

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Production, Marketing Skills Developed in Fort Worth Classes

Officially, it's called the Production and Manufacturing Management Program.

But graduates and students in the Fort Worth in-house program have nicknamed it "Ashton U" after its founder, James E. Ashton, the division's Vice President of Production.

Now in its fifth session, the year-long program is designed to develop management talent with an emphasis on production and marketing in the aerospace industry.

"Soon after I joined the Production Department, it became clear we could increase efficiency through academic training," said Ashton, who has three advanced degrees including a Master of Business Administration from the Harvard Business School and a doctorate in structural mechanics from the Massachusetts Institute of Technology.

"I think the course has been very effective—we now have 82 professional employees who have a better understanding of the problems and solutions of aircraft production. It has increased teamwork and furthered understanding between departments," he said.

Those who have taken the course, which meets twice a week for two hours in the factory theater, agree.

"I think the most visible benefit was in establishing contacts between Production and other areas," said Dave Raub, a computer software systems representative who completed the course early this year.

"It's an exceptional education opportunity," added Diane Hanson, a member

Post Guidance System Tested

Tests of a new guidance system for Pomona's Stinger shoulder-fired anti-aircraft missile were successfully completed recently at the Naval Weapons Center, China Lake, Calif.

Installed aboard a rocket sled to simulate supersonic flight conditions, the Passive Optical Seeker Technique (POST) guidance section performed in accordance with computer predictions.

The successful sled tests were prerequisite to actual flight tests scheduled later this year.

The POST guidance system incorporates a unique scanning technique which improves the Stinger's ability to discriminate targets from background.

The POST guidance assembly will be introduced as a modular change to Stinger missiles.

of the Quality Assurance Engineering Department, "because it is structured to combine management theory with actual practice."

The program is broken down into four major courses: managerial accounting and financial analysis, organizational structure and behavior, production management and marketing.

Ashton conducts two of the sessions at the end of each course in which he details how the theories are applied at the division.

College credit is not given for the course although professors from several local universities are involved and the work is aimed at the graduate level.

Initially, the program was designed for the Production and Manufacturing departments, but later it was broadened to include the Material, Quality Assurance and Logistics and Engineering departments.

24 77 Stinger Passes Flight Tests

Pomona's Stinger, a shoulder-fired, heatseeking, air defense system, successfully passed the U.S. Army's qualification flight test by scoring five hits in six attempts against aerial targets at White Sands Missile Range, N.M.

During the test, Stinger intercepted three airplane target drones flying at high speeds and two stationary targets which simulated hovering helicopters. The primary objective of the flight qualification tests was to prove the missile's flight and seeker systems.

"We have passed a very significant milestone in this testing phase by demonstrating that Stinger is both effective and reliable," said Ron Tuley, Stinger Program Director.

Test requirements established by the Army before the 10-day test stipulated that five of six missiles tested must successfully engage the target.

The Army required that missiles involved in the flight qualification test be subjected to an environmental conditioning process in which missiles are dropped, vibrated, submerged in water and exposed to a variety of adverse conditions simulating the rough treatment a weapon used by the infantry may be exposed to in a combat situation.

Stinger is scheduled for deployment with Army forces in November. The current contracts call for production of several thousand units in the next two years.



Gold Knight. Ken Newton (right) Convair's Base Manager at Vandenberg AFB, holds the Gold Knight of Management Award that he received from the California Central Coast Area Council of the National Management Association. C. E. Wilson, Director of Launch Vehicle Programs, was on hand to congratulate Newton.

Aero-Artist Keith Ferris Paints F-16

The Keith Ferris rendering of the F-16 Fighting Falcon shown at the right, also appears on the official Air Force Association 1980 Calendar. It was done last year soon after the 388th Tactical Fighter Wing at Hill AFB, Utah, received the first of its F-16 multi-mission fighters.

Ferris, whose realistic aerospace/aviation art has won worldwide acclaim, recently flew an F-16B at Hill in preparation for an F-16 oil painting he is now executing for the Air Force Art Collection at Tactical Air Command Headquarters, Langley AFB, Va.

The artist's post-flight comment was, "Love that airplane!"

Ferris, who designed the 21-cent U.S. International Air Mail Postal Card, has also published a book of his aviation art which includes 40 reproductions of his works.

The son of an Air Force officer, Ferris began his career in 1947 illustrating Air Force Training Publications at Randolph AFB, Tex. Since 1956, he has lived in the New York City area, working as a free-lance artist for private industry, associations, museums and related groups. His personal reference library includes thousands of aeronautical publications, photos and transparencies.

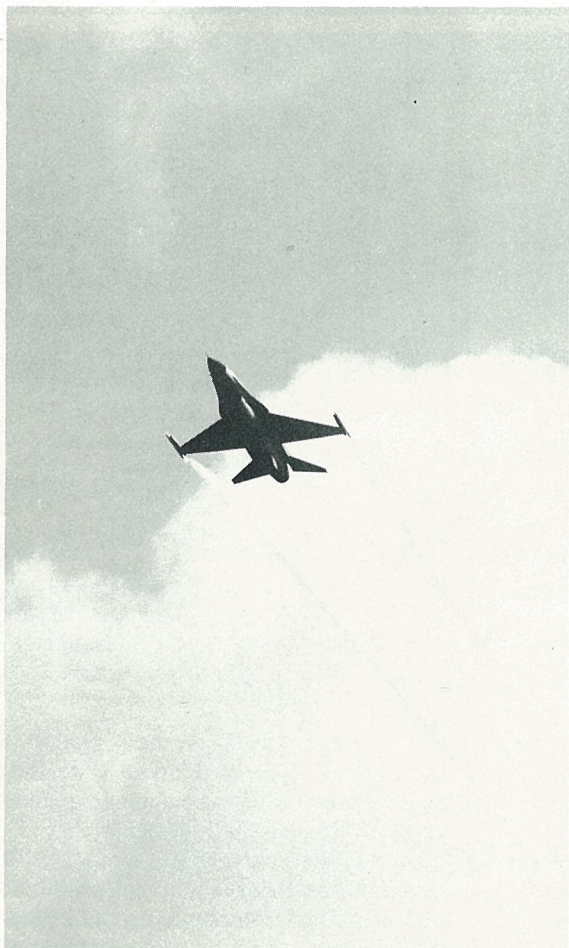
He is also an inventor who holds two patents covering aerial camouflage schemes.

A long-time lecturer and historian in aviation art as well, Ferris's commissions include the famed 25-foot by 75-foot "Fortresses Under Fire" oil mural at the National Air and Space Museum in Washington, D.C. He is currently working on another mural for the museum which depicts the evolution of jet aviation.



The F-16 Is Here

Courtesy of Keith Ferris



At Farnborough. The F-16 Fighting Falcon was a featured performer in flight demonstrations at the Farnborough International Air Show in Great Britain. The F-16B used smoke trails to accentuate its ability to achieve a high angle of attack and its tight turning capabilities.

Authorization Bill Affects GD Programs

President Carter has signed a \$52.8 billion military authorization bill for Fiscal 1981 that includes provisions for programs involving a number of General Dynamics divisions.

The legislation authorizing military procurement is a compromise worked out by conferees from the House and Senate Armed Services Committees. The actual funds will be included in future appropriations legislation.

The authorization legislation affects major programs at Fort Worth, Electric Boat, Convair and Pomona divisions:

F-16: The authorization includes \$1.7 billion for the procurement of 180 U.S. Air Force F-16 Fighting Falcon fighters in Fiscal 1981. Also included was \$166.8 million for advanced procurement of Fort Worth F-16s which will be built in Fiscal 1982. Congress also voted \$42.3 million for research and development (R&D) on the F-16, \$89.8 million for spares and \$27.7 million for specialized tooling which will support F-16 units.

DIVAD: Congress authorized \$204.7 million for the Division Air Defense (DIVAD) gun system, including \$140 million for procurement and \$64.7 million for R&D. Pomona's DIVAD is undergoing U.S. Army tests in a competition with a DIVAD system developed by Ford Aerospace.

Sparrow: The authorization includes \$141.1 million for the procurement of 770 Sparrow air-to-air missiles for the U.S. Navy, and \$143 million was voted to purchase 1,140 Sparrows for the Air Force. The Air Force figure includes \$3.1 million for R&D. Pomona is a second source for the missiles.

Standard Missiles: The President authorized \$303.1 million to procure 845 Standard Missiles produced by Pomona, while \$40.1 million was authorized for R&D.

SSN 688: The measure contained \$1.1 billion for two nuclear SSN 688-class submarines for the Navy and an additional \$5 million for R&D. Electric Boat is one of two builders of 688-class submarines.

Tomahawk: \$163 million was authorized for the procurement of 50 sea-launched Tomahawk missiles and another \$130 million was approved for R&D.

GLCM: The Air Force received approval for 11 ground-launched cruise

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September 1980

10th Liquefied Natural Gas Tanker Louisiana Named at Quincy

Louisiana, the 10th liquefied natural gas (LNG) tanker to be built by Quincy Shipbuilding Division, was christened at the yard during ceremonies on Aug. 26th.

Mrs. Dwight H. Seely Jr., wife of the Chairman and Chief Executive Officer of Trunkline LNG Co. of Houston, christened the giant 936-foot long ship that will transport LNG from Algeria to the United States.

During the ceremony, which was attended by shipyard employees, their families and invited guests, David S. Lewis, GD Chairman and Chief Executive Officer, said that everyone present had "mixed feelings" about the event.

Lewis said that there were feelings of joy at the ship being completed, but that "there is a great deal of regret that this is the end of an era" as Quincy had no additional LNG tanker contracts.

However, Lewis said, "The people that we have in this yard have proven themselves again, as they have in the past, to be an outstanding group of skilled people, and I think they are better prepared for the future... we are determined to keep this shipyard alive and vigorous."

Louisiana's five spherical cargo tanks have a capacity of carrying 125,000 cubic meters of LNG at minus 265 degrees F., enough gas to serve an American city of 500,000 for a month.

The vessel will have a crew of 30. She has a design speed of 20 knots and can load and unload her cargo in 12 hours. She will fly the American flag and will be manned by American crews.

The LNG tanker was built for Lachmar, a partnership of subsidiaries representing Panhandle Eastern Pipe Line Co., Houston; Moore McCormack Bulk Transport Co., Stamford, Conn.; and General Dynamics. Trunkline Gas, a subsidiary of Panhandle, has a purchase contract for the gas with Sonatrach, the national oil and gas company of Algeria.

Eight LNG tankers previously built at Quincy have made a total of 274 round trips and have delivered over 33 million cubic meters of liquefied natural gas from Indonesia to Japan. The Louisiana and her sister ship, the Lake Charles, completed earlier this year for Lachmar, will transport gas to the United States Gulf Coast.



Louisiana Named. Mrs. Dwight H. Seely Jr., Louisiana's sponsor, wipes champagne from her hands after naming Quincy Shipbuilding's 10th liquefied natural gas (LNG) tanker. On hand for the ceremony were (from left), Dwight H. Seely Jr., Chairman and Chief Executive Officer of Trunkline LNG of Houston, Mrs. Liza Kutner Jr., Matron of Honor and Mrs. Seely's sister, and David S. Lewis, Chairman and Chief Executive Officer of General Dynamics.

F-16 Performs Before Crowds At Farnborough

The F-16 Fighting Falcon was a featured performer in flight demonstrations August 31st to September 7th at the Farnborough International Air Show in England.

The Fort Worth built aircraft - a two-seat F-16B leased from the U.S. Air Force - performed flight demonstrations over the field and was on static display.

The aircraft was flown on alternate days by Neil Anderson, International Director of Flight Evaluation and Engineering at Fort Worth, and James A. McKinney, Experimental Test Pilot at Fort Worth.

This was the first appearance of an F-16 at the Farnborough show, a biennial display of first-line military and commercial aircraft from the United States and numerous other countries. The F-16 was one of a number of advanced fighters that were on display at the show.

Another first for the F-16 was the use by Anderson and McKinney of smoke trails from the wingtips during the flight demonstrations to accentuate the F-16 Fighting Falcon's unique ability to achieve a high angle of attack and its tight turning capability.

See Photos Page 4

The demonstration aircraft was flown to and from England for Farnborough International 80 by a U.S. Air Force pilot. The aircraft began operational service in July 1979 and is now assigned to the 388th Tactical Fighter Wing at Hill AFB, Utah.

Among the guests who examined the F-16 while it was parked on static display, were U.S. Air Force Secretary Hans Mark, former Deputy Secretary of Defense David Packard and senior military and government officials from several other countries.

The F-16 was also viewed by many thousands of attendees during the three final public days of the show.

An F-111F tactical fighter/bomber, also produced by Fort Worth, was flown in from its base at RAF Lakenheath in England and placed on static display by the U.S. Air Force.

The USAF also brought over a technology exhibit that featured a model of the Advanced Fighter Technology Integration (AFTI) F-16 which is under development at Fort Worth.

Continued on Page 4

Louisiana Lou Finds Dock Is Nothing Like the Open Sea

This is a story about the big one that got away. And it's true.

The story began unfolding August 28th when the huge *Louisiana*, Quincy Shipbuilding's 10th liquefied natural gas tanker, pulled into Basin 13 at the shipyard after sea trials.

"Hey, look at that," someone shouted, pointing to the area between the bow of the 936-foot ship and the forward basin wall. "Looks like we brought a whale home with us."

See Story Page 1

The observer was on target. What he saw in the basin was a 9-foot, 900-pound Risso's Dolphin, also known as a grampus whale.

"It'll probably swim out later," someone said. "Maybe it's trapped," volunteered another. It was. Or so everyone thought the next day when it was still cavorting under *Louisiana*'s bow.

Shipyard officials called the New England Aquarium in nearby Boston. The aquarium sent a crew; shipyard and aquarium officials huddled. Their decision: to get the beast out of the basin without harming it.

They could back *Louisiana* out of the basin, providing a wide berth for the dolphin to escape. No, aquarium officials said, it might just stay anyway. It'll have to be netted, they concluded.

Dr. John Prescott, the aquarium's Executive Director, would lead the rescue attempt with the shipyard lending a big hand.

The Quincy team included divers Mike Umbrianna, Mike Walsh and Barry Ellis; riggers Albert and Edward Mariano, William Knopf and Chester Spencer, with nets, and crane operator Mike O'Toole, who would lift the dolphin out in a specially designed sling. Stanley Cleaves, rigging foreman, would direct the crew.

Dawn the next day found the crew lacing large nets together with floats on one edge and steel and lead weights on the

other. The plan: corner the dolphin by lowering a 180-foot by 60-foot net into the water.

The idea, fine in theory, was promptly disproved by the marine Houdini: two boats manned by divers and aquarium personnel dropped the nets and twice the dolphin eluded them. On the third try, the dolphin appeared to swim directly into the net. "Now they've got it!" an excited onlooker shouted. But then the dolphin pulled a disappearing act. A long 15 minutes later, a shipyard worker pointed to the stern of the *Louisiana*. "There it is," he yelled.

Sure enough. The dolphin, apparently fed up with its would be rescuers, had swum the length of the basin and as a final insult, then slipped under the only obstacle blocking his final exit into the Fore River — an oil boom enclosing the basin.

The rescue attempt had taken more than five hours.

"I think we were successful," said Prescott. "We wanted to get it out of there and we did."

There's a sequel to this story, though. Several hours later, the dolphin turned up stranded on nearby mud flats. Aquarium personnel rescued it, transported it by truck to the aquarium, where they put it into an "intensive care" tank, as it was suffering from stress.

At press time, the dolphin was eating and had been transferred to the aquarium's main pool with other dolphins and some sea lions.

"It's still in guarded condition," reported Jack Pearson, the aquarium's Director of Mammal Training, who, along with other staff members, discovered that the dolphin is a female.

"It will be a few weeks before we know whether we can release her because she's still not in good shape."

Meanwhile, the aquarium's newest resident is getting used to its new home and a new name — "Louisiana Lou."



Grimes



Reitz



Lennox

Three Executives Named To Key Marine Positions

Gary S. Grimes, who joined General Dynamics 11 years ago as a management intern, has been named General Manager of Quincy Shipbuilding Division.

In announcing the appointment, P. Takis Veliotis, General Dynamics Executive Vice President-Marine and General Manager of Electric Boat Division, said that Joseph H. Lennox, who has been General Manager of the Quincy shipyard for the past two years, will become Managing Director of Lachmar, the company which owns and operates the liquefied natural gas (LNG) tankers *Lake Charles* and *Louisiana*.

Veliotis also announced that Spencer Reitz, who joined General Dynamics in 1969 following a career in the U.S. Navy, will become Deputy General Manager of Electric Boat, the position previously held by Grimes.

Grimes is a graduate of Alfred University in Alfred, N.Y., and received his Master's of Business Administration degree from Syracuse University. He was transferred to Quincy Shipbuilding in 1970 as Chief of Production Support and later served as Assistant to the General Manager, Director of Planning and Facilities and, in 1975, was named Controller at Quincy. He was transferred to Electric Boat in 1977.

Reitz, a graduate of the University of Michigan and Massachusetts Institute of Technology, where he received a master's degree in naval construction and engineering, served 28 years in the Navy before retiring in 1969 with the rank of Captain. He served in a variety of engineering and staff assignments both ashore and afloat.

He held senior engineering positions at Quincy prior to his transfer to Electric Boat in 1977 as Assistant General Manager-Engineering.

Lennox, a veteran of over 23 years of shipbuilding experience, is assuming a newly created position with Lachmar, a

W. L. Godsey Named GD's European Marketing Director

William L. Godsey has been appointed Corporate Director-Europe for General Dynamics' international marketing operations. Headquartered in the company's office in Brussels, Belgium, Godsey will be responsible for directing and coordinating all General Dynamics marketing activities throughout Europe and will provide support and assistance to the company's various operating components.

A native of Bristol, Tenn., Godsey joined General Dynamics in 1956 at Fort Worth and has held a number of engineering and management positions with the company, most recently as Corporate Director-Eastern Region Government Relations headquartered in Dayton, Ohio.

Godsey was graduated from the University of Tennessee in 1956 with a bachelor's degree in mechanical engineering and also holds a certificate in national security management from the Industrial College of the Armed Forces.

Godsey replaces Norman C. Stranberg, who has been named Corporate Director-Middle East with headquarters in Athens, Greece.

partnership made up of wholly owned subsidiaries of General Dynamics, Moore McCormack Resources Inc. of Stamford, Conn. and Panhandle Eastern Pipe Line Co. of Houston.

He is a graduate of the College of Technology, Queen's University in Belfast, Northern Ireland, and joined Quincy in 1973. He has had primary responsibility for the construction of the LNG tankers there. Prior to joining Quincy, he was with Davie Shipbuilding Ltd., Quebec, Canada, where he held a number of senior management positions.

FB-111 Rebuilt From 2 Planes

An FB-111 strategic bomber reconstructed from parts of two other FB-111s was delivered to the U.S. Air Force by Fort Worth Division in early September.

Fort Worth technicians used the remains of a plane that had been damaged and burned several years ago and parts from a test FB-111 that had never been converted into an operational aircraft. In addition, about 5,000 parts had to be made and all wiring replaced.

Rebuilding the aircraft cost about \$6.9 million compared with the \$40 million that a new FB-111 bomber would cost today.

Because of the success of the program, Fort Worth is presently negotiating with the Air Force about rebuilding several other F-111s that cannot now be flown.

System Century DCO Installed In Washington

A Stromberg-Carlson digital telephone network was placed into service this summer at the Cascade Telephone Co. in North Bend, Wash. The network consists of a Stromberg-Carlson digital central office (DCO) connected to five digital satellite units (DSUs) which are remote unattended switching stations. Both the DCO and DSUs are members of the System Century family of digital switching systems.

The network serves telephone customers in four communities located within a 15-mile radius of North Bend, which is east of Seattle. Customers in this area previously were connected directly to a single central office equipped with analog switching systems. The new network connects customers to local satellite switches which are linked to the digital central office. This configuration is expected to result in substantial cost savings for Cascade Telephone in outside plant and construction.

A major feature of the network is its optional custom-calling features. Only the Stromberg-Carlson DCO can offer three-way calling, call forwarding and call waiting without giving up existing or potential line capacity. In the Cascade Telephone system, custom-calling services installed in the central office are available to customers served by the five remote offices.

Cascade Telephone is a subsidiary of Telephone Utilities Company, Inc., of Portland, Ore.

GD's Commercial Products Displayed at Show in China

General Dynamics' commercial operations participated at the Beijing (Peking) Exhibition of Samples of New Foreign Products that was held in July and early August in China.

The show was sponsored by the People's Republic of China's Academy of Sciences and Ministry of Foreign Trade. More than 20,000 engineers, technicians and government officials viewed the technical and industrial displays by 16 exhibitors from the United States and other countries.

The divisions and subsidiaries from General Dynamics which participated in the exhibition were: Stromberg-Carlson, DatagraphiX, General Dynamics Communications Company, American Telecommunications Corp., Quincy Shipbuilding, Asbestos Corporation Limited, Electronics and Marblehead Lime.

At the show, Stromberg-Carlson exhibited digital branch exchanges and telephones, while DatagraphiX showed its Mini-AutoCom and 132B display and Electronics had models of two environmental buoys. Quincy Shipbuilding had models of an aluminum liquefied natural

gas (LNG) containment sphere and two LNG tankers. Asbestos Corp. displayed asbestos fiber samples.

Ken Hoyt, Stromberg-Carlson's Vice President-International, welcomed the guests to the opening ceremonies which were televised over local Beijing channels.

"Telecommunications and technical development have a high priority in China since the country's industrialization is limited in quantity and quality," Hoyt said. "For example, there are only one million telephone outlets in China compared to more than 175 million in the United States."

Chinese plans to improve industry, agriculture and education represent a large business opportunity, Hoyt said. For example, he noted the Chinese plan to install more than one million telephone lines annually to improve the country's telephone network.

Representing General Dynamics at the exhibition were: Corporate President Oliver C. Boileau, Executive Vice President Guy W. Fiske and Vice President-International Lyman C. Josephs.

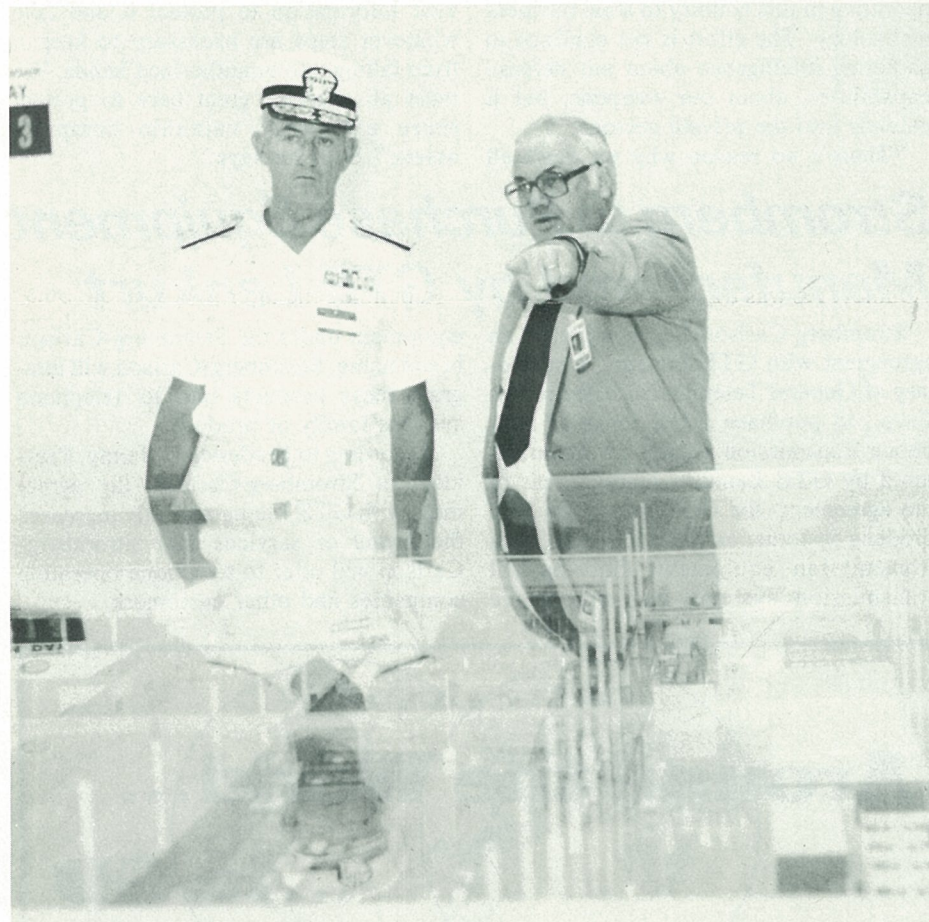
Savings And Stock Investment Values

	July 1978	July 1979	July 1980
Salaried			
Government Bonds	\$ 2.0194	\$ 2.1943	\$ 2.4762
Diversified Portfolio	1.3300	1.4585	1.8771
Fixed Income	--	1.0079	1.1072
Hourly			
Government Bonds	2.0181	2.1947	2.4742
Diversified Portfolio	1.3602	1.4922	1.9151
GD Stock	\$33.20*	\$32.25	\$73.125

*Reflects 2½ for 1 stock split



Summer Fun. Convair's Family Fun Day August 24th at Missile Park was just that – "family fun" – with a little for everyone. The small fry participated in the traditional picnic events such as sack races, treasure hunts, tugs of war and rope climbs. The youngsters (and oldsters) also kept the engineer of the miniature train busy (1,600 rides). The operator of the merry-go-round (1,100 rides) was also a very popular person. Of interest to the entire family was a Health Fair, a visit by the San Diego Police Department's Crime Prevention Unit and a landing in the park by San Diego's Life Flight Helicopter. Oh yes, the 18,000 folks who jammed the park consumed thousands of snow cones, 65 kegs of beer (that's 10,725 12-ounce cups) and 70 giant tanks of soft drinks.



Admiral's Visit. Using a model, Convair General Manager Dr. L. F. Buchanan points out cruise missile manufacturing facilities to Admiral A. J. Whittle, Chief of Navy Materiel, during the admiral's recent visit to Convair's Kearny Mesa facility.

Convair Service Awards

40 Years

W. M. Bender, R. E. Bowman, W. Garcia, F. M. Grant Jr., I. D. Howarter, D. D. Klinger, L. F. Lewis, R. N. Lewton, P. H. Rudolph, J. P. Ruiz, R. S. Shorey, J. F. Ames.

35 Years

L. F. Cescolini, C. W. Haffly, P. B. Stanley.

30 Years

C. L. Cheves, R. H. Churchill, L. H. Cordova, L. M. Curry, C. DiMaggio, L. H. Fry, C. M. Gudmundson, J. A. Hawke, C. W. Hendon, J. B. Heringhaus, R. P. Herrmann, W. F. Hoover, R. B.

Katan, O. F. Kennann, N. S. Kourbelas, J. I. Laird, C. J. Lambie, T. A. Martinez, Y. T. Matsuka, L. C. Michenfelder, R. B. Riggan, A. Roberts, W. B. Swindall Jr., R. C. Thomas, R. G. Umholtz Jr., L. F. Vought, G. E. Wilson, W. E. Wise, A. B. Wood Sr., W. B. Young, R. N. Bishop, J. E. Burgeson.

25 Years

G. C. Bertrand, H. M. Brown Jr., C. H. Camp Jr., R. Danner Jr., J. E. Hart, C. R. Harter, L. J. Hayes, H. L. Lowe, N. T. Keith, J. M. Klimczyk, J. M. MacDonald, J. R. Mattson, S. J. McMillan, C. P. Norwood, E. M. Ogden, J. G. Simmons, R. A. Wallace, J. W. Weaver, D. E. Williams, R. A. Clark, R. L. Farrar, J. H. Fountain, S. W. Fung, J. B. Griffin, J. J. Letzring, E. R. McFadden, A. L. Merrow, J. L. Minos, G. V. Owsley, J. T. Phillips, H. L. Prettyman, E. F. Stelmar, R. T. Tuttobene, B. Villanueva, R. F. Voell, R. J. Wilson, V. A. Wiltse, R. A. Wyckoff, A. B. Yanke.

College Interns Return to School After Spending Summer at Convair

"For the first time I was able to apply my studies in a real world environment" – Frances Lombard, Boston University.

"It gave me a look at the practical side of engineering" – Darryl Crawford, University of Illinois Chicago Circle Campus.

"The summer work reaffirmed my belief that I was taking the right courses" – Dale McIntosh, San Diego State.

"It's a lot different from the textbooks" – Virginia Thompson, University of Denver.

"There's a lot to learn; you have to ask questions" – Jeff Anderson, University of California at Berkeley.

* * *

Those are comments from a few of the 53 student interns who have returned to their college studies following three months working at Convair Division.

All of the participants in the College Intern Program left Convair pleased they had been given the opportunity to combine theory with actual work in their chosen field through the program, according to Virginia Perkins, Convair's College

Relations Representative.

Lombard, a mechanical engineering major, said her work at Convair was "very challenging." She was involved with the launcher design for the Tomahawk Ground Launched Cruise Missile. "Things are sometimes handed to you at school; here you have to go do it," she said.

"I regret that I wasn't able to get involved in this type of program earlier," said Crawford, an electrical engineering major, who spent three months in the avionics group.

McIntosh, placed in the mission performance and analysis group, said his stay was "very rewarding... I was always treated as a professional by my co-workers and superiors," he said.

A business major, Thompson worked in the finance and forecasting group at the Lindbergh Field Plant. "Now that I have this experience," she said, "I can go back to school and use what I have learned."

The 1980 group represented 33 universities and nine were returning interns from last year's program.



Frances Lombard

Pomona Spins Glass Threads For Missile Seeker Circuits

The first custom-made fiber optics – threadlike glass strands built to meet specific requirements for transmitting infrared frequencies in missile seekers – have been developed by Pomona scientists.

The fibers will be used in several weapon systems developed at Pomona.

Fiber optic strands carry light impulses in much the same way an electric current is conducted by copper wire. Infrared seekers are expected to play a major role in future generations of weapon systems because the infrared light frequency gives seekers improved target discrimination and increased capability to function in smoke and adverse weather conditions.

After 1½ years of experimenting with various glass formulas and production processes, Dr. Melvin Charters, Chief of Manufacturing Technology of Electronics and Structural Processes, and Lee Upton, an expert glassmaker hired as a consultant on this project, have produced miles of the glass strands in a few days.

"It doesn't take long to produce the actual fiber once you find the proper formula for making a glass that meets the optical requirements we are talking about," says Charters, "but developing the formula for such a glass and finding the proper production method is a very difficult job."

Fiber optics materials designed for use in the communications industry have been available for several years, but Pomona engineers have found such fibers will not fulfill the requirements of highly sensitive seekers systems.

The glass is made of a compound called arsenic trisulfide, which is primarily composed of arsenic and sulfur. Two types of arsenic trisulfide glass, one with a higher arsenic concentration, are combined to produce a single strand of fiber.

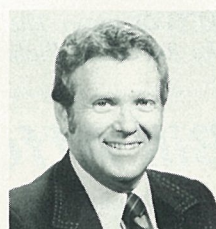
One glass is used to make an outer covering called the 'cladding.' The other

mixture is used for the core glass. After heating the glass to a molten state, it is drawn through a specially designed opening and stretched into a perfectly proportioned glass strand.

Rector Appointed To Space Program Post at Convair

W. F. Rector has been appointed Director of Advanced Space Programs at Convair.

He will be responsible for directing the company's advanced space efforts for National Aeronautics and Space Administration (NASA) and Department of Defense programs.



Rector

Rector rejoins Convair from TRW where, since 1966, he served in space-related management positions, most recently as Manager of Space Transportation Systems Applications. Prior to that he was Manager of Manned Space Systems supporting the development of Spacelab in Europe and payloads in the United States.

He began his career at Convair in 1953 and was a thermodynamics engineer on the Atlas and Centaur programs before becoming a project engineer specializing in manned space systems. He left Convair in 1962 to join NASA in Houston as Project Officer for the Lunar Module in the Apollo Spacecraft Project Office. He was later manager of the payloads definition efforts on NASA's Skylab Program before going to TRW.

Rector was graduated from the University of California at Berkeley in 1956 with a bachelor's degree in mechanical engineering.

GD World

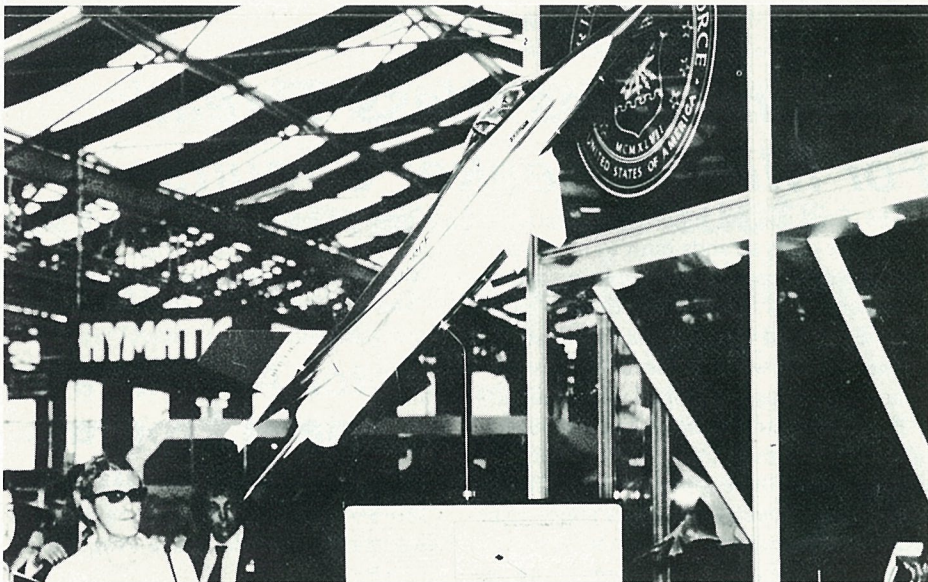
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Secretary's Visit. Neil Anderson, Fort Worth's International Director of Flight Evaluation and Engineering (right), discusses the F-16 with U.S. Air Force Secretary Hans Mark (left) and the secretary's Military Assistant, USAF Col. C. C. Rogers Jr., at Farnborough (See Story Page 1).



Inside Look. Austrian Air Force Divisionar Gustav Golja takes an inside look at the high visibility cockpit of the F-16 at Farnborough.



AFTI Display. The U.S. Air Force exhibit at Farnborough 80 included this model of the Advanced Fighter Technology Integration (AFTI) F-16.

Protecting GD Information Is Employee Responsibility

Protecting the security of General Dynamics' technological innovations and business information is vital to the future health of the corporation and is the responsibility of all employees, says Warren Sullivan, Corporate Vice President-Industrial Relations.

"We operate in a number of extremely competitive markets, and if we are careless in handling our technical developments or our business plans, it could cost our corporation business and our employees their jobs in the future," he says.

To alert employees to sensitivity of information, General Dynamics uses two categories internally which identify information that must be protected and not released to the public - Proprietary Information and Private Information.

General Dynamics Proprietary Information covers technical developments, trade secrets and manufacturing processes that are valued by General Dynamics, but not protected by a patent. If a domestic or foreign competitor obtained this information, it could mean General Dynamics would be paying another company's research and engineering costs or could even place our country at a disadvantage internationally.

Speaking about this type of technological information with a group of business and labor leaders, William H. Webster, Director of the Federal Bureau of Investigation, said recently, "There's a massive effort among Communist-bloc countries operating in this country to steal business technology. The effort is not confined to gathering intelligence about our defense capabilities, about our weapons, but it extends into the private sector.

"There's no reason why we can't all

work together to keep those who are hostile to our country and our way of life, from getting a free leg up by having our secrets and the work of our labor made available, simply because they are able to steal it."

General Dynamics Private Information covers business operations, contract and personnel information which could place us at a disadvantage in the marketplace if it were known by our competitors.

"As a public corporation, there is a great deal known about our business and our products," Sullivan says. "We are required by law to provide detailed financial results and other information to investors. People who invest their funds in General Dynamics stock deserve to know all we can tell them without disclosing information that might harm our plans. But there is a great deal of information which should not be allowed to become general knowledge," says Sullivan.

"The present strength and future success of General Dynamics is based to a very large degree on our scientific and technical leadership," says Sullivan. "We are pursuing key technologies in a number of areas which will improve the performance of our present products and provide the foundation required to develop the next generation of advanced systems. This means business and jobs.

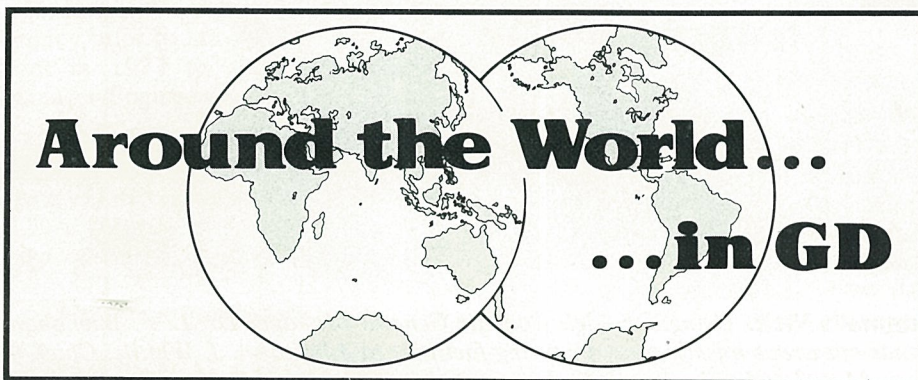
"It is the personal responsibility of every employee who has access to General Dynamics Proprietary and Private Information to protect it and take whatever steps are necessary to keep it from falling into unauthorized hands. We must all exercise great care to protect these extremely valuable company assets," Sullivan says.

Stromberg to Purchase Equipment Manufactured by GTE Lenkurt

Stromberg-Carlson has completed an agreement with GTE Lenkurt, a subsidiary of General Telephone & Electronics Corp., to purchase a full range of telephone transmission equipment manufactured by GTE Lenkurt. Under terms of the agreement, the GTE subsidiary will produce customer carrier equipment, data transmission equipment, fiber-optical transmission systems and microwave

equipment under the Stromberg-Carlson brand name. Stromberg-Carlson will integrate these products into its telephone systems family of products.

According to Frederick F. Jenny, President of Stromberg-Carlson, the agreement with GTE Lenkurt greatly increases the scope of services that Stromberg-Carlson will offer to telephone operating companies and other customers.



CHQ: John N. Watters joined as Corporate Manager Financial Planning-Commercial.

EB: Curtis B. Shellman Jr. joined as Assistant to the General Manager.

Marine Group-Quincy: Donald J. Main joined as Marketing Manager-Marine Group.

Asbestos: Ronald G. Devin was promoted to General Manager-Asbestos Hill.

Electronics: William A. Cole and Ralph O. Mann joined as Principal Engineer... David J. Husted joined as Marketing Manager.

Pomona: George Alexandris, Jay H. Martin, William J. Wilsterman and Irvin H. Kral joined as Design Specialist... William J. Greif joined as Project Staff Engineer... John J. Sennikoff was promoted to Production Line Manager.

Fort Worth: Kevin R. Dwyer joined as Engineering Test Pilot... Alex D. Krieger and R. Kenneth Bowers joined as Marketing Specialist... Vincent W. Henson was promoted to Assistant Project Engineer... Kenneth F. Taylor was promoted to Group Engineer.

Convair: John C. Barrons joined as Manager of Equal Employment Opportunity & Educational Programs... David W. Cormany joined as Manager, Industrial Engineering... Joseph A. Erbacher, Frank Hauser, Earl F. Starr and Robert E. Stewart joined as Engineering Specialist Senior... Joseph M. Nicosia joined as Engineering Chief... Lloyd R. Norris joined as Engineering Staff Specialist... Joel M. Selber joined as Operations General Supervisor-Manufacturing.

GDCC: William H. Harkins transferred from DatagraphiX and was promoted to Manager-Material... Edward F. Richie joined as Director of National Sales-Com Dev.

Freeman United: Jan Pivec joined as Budget Manager.

Bill Affects GD Programs

Continued from Page 1

missiles (GLCMs), at a cost of \$75.3 million. An additional \$14.3 million was approved for advanced procurement.

MRASM: The authorization bill included \$23 million for R&D on the Medium Range Air-To-Surface Missile (MRASM), on which Convair is the sole contractor.

Phalanx: Pomona's Phalanx close-in ship defense system received an authorization of \$134.3 million for the procurement of 62 systems and an additional \$2.1 million for R&D.

Advanced Bomber: Congress authorized \$300 million for R&D and another \$75 million for procurement of an advanced bomber for the Air Force. Fort Worth division has proposed a FB-111B/C to fill the role of the advanced bomber.

In a separate item, Congress authorized \$10 million for R&D to improve existing F-111s.

KC-10A: The bill authorizes the purchase of six additional KC-10A advanced

tanker/cargo aircraft for \$298.4 million. The fuselage of the aircraft is constructed at Convair for McDonnell Douglas.

SL-7 Cargo Ships: Congress approved \$285 million for the procurement of eight SL-7 cargo ships for the Rapid Deployment Force. Quincy Shipbuilding Division will compete for this project. The authorization of \$600 million for the rework of the battleship *New Jersey* and the aircraft carrier *Oriskany* could also mean work for Quincy.

Trident: Congress approved \$1.09 billion for a ninth Trident ballistic missile submarine to be built at Electric Boat.

Stinger: A total of 1,700 Stinger missiles - costing \$90.1 million - was authorized for the Army and the U.S. Marine Corps. The shoulder-fired, surface-to-air Stinger is produced by Pomona.

Viper: The House and Senate approved \$14 million to procure 13,000 Viper antitank missiles which are manufactured by Pomona.

New Contracts May Mean 6 More Tankers

In early October, General Dynamics entered into provisional contracts to build six liquefied natural gas (LNG) tankers at Quincy Shipbuilding. Sales price of the six ships would exceed \$1 billion.

Actual construction of the six tankers is dependent upon the satisfaction of certain conditions, including approval by the U.S. Maritime Administration (MARAD) of a construction differential subsidy and financing through long-term bonds guaranteed by the United States under Title XI of the Merchant Marine Act of 1936, as amended. Application has been made to MARAD for the construction subsidy and Title XI financing.

A start-up date for construction of these ships also is dependent upon the results of further hearings before federal and state regulatory bodies with respect to the site of an LNG receiving terminal in California.

Contracts for three tankers apiece were signed with Zapata Western LNG Inc., a subsidiary of Zapata Corporation of Houston, Tex., and Ogden Marine Indonesia Inc., a subsidiary of Ogden Corporation of New York, N.Y.

The six ships would be part of a fleet of tankers that would transport LNG from Indonesia to the U.S. West Coast under an import agreement between Pertamina (the Indonesian national oil company) and Pacific Indonesia LNG Company — a U.S. corporation jointly owned by Pacific Lighting Corporation and Pacific Gas & Electric Company. The tankers would belong to, and be operated by, partnerships between newly formed General Dynamics subsidiaries and Zapata Western LNG and Ogden Marine Indonesia.

The new tankers would be identical to 10 completed at Quincy's shipyard during the last four years. These ships each have the capacity to transport 125,000 cubic meters of LNG and are more than 900 feet long. The LNG is carried in five 120-foot-diameter aluminum containment spheres at a temperature of minus 265 degrees Fahrenheit.

Eight of these ships already have delivered more than 33 million cubic meters of LNG from Indonesia to Japan, logging nearly 300 round trips. The two others are scheduled to transport gas to the U.S. Gulf Coast from Algeria.

F-16s Assigned To South Korea

In its first overseas assignment, the U.S. Air Force F-16 Fighting Falcon will support United States forces in defending the Republic of Korea, according to an Air Force announcement.

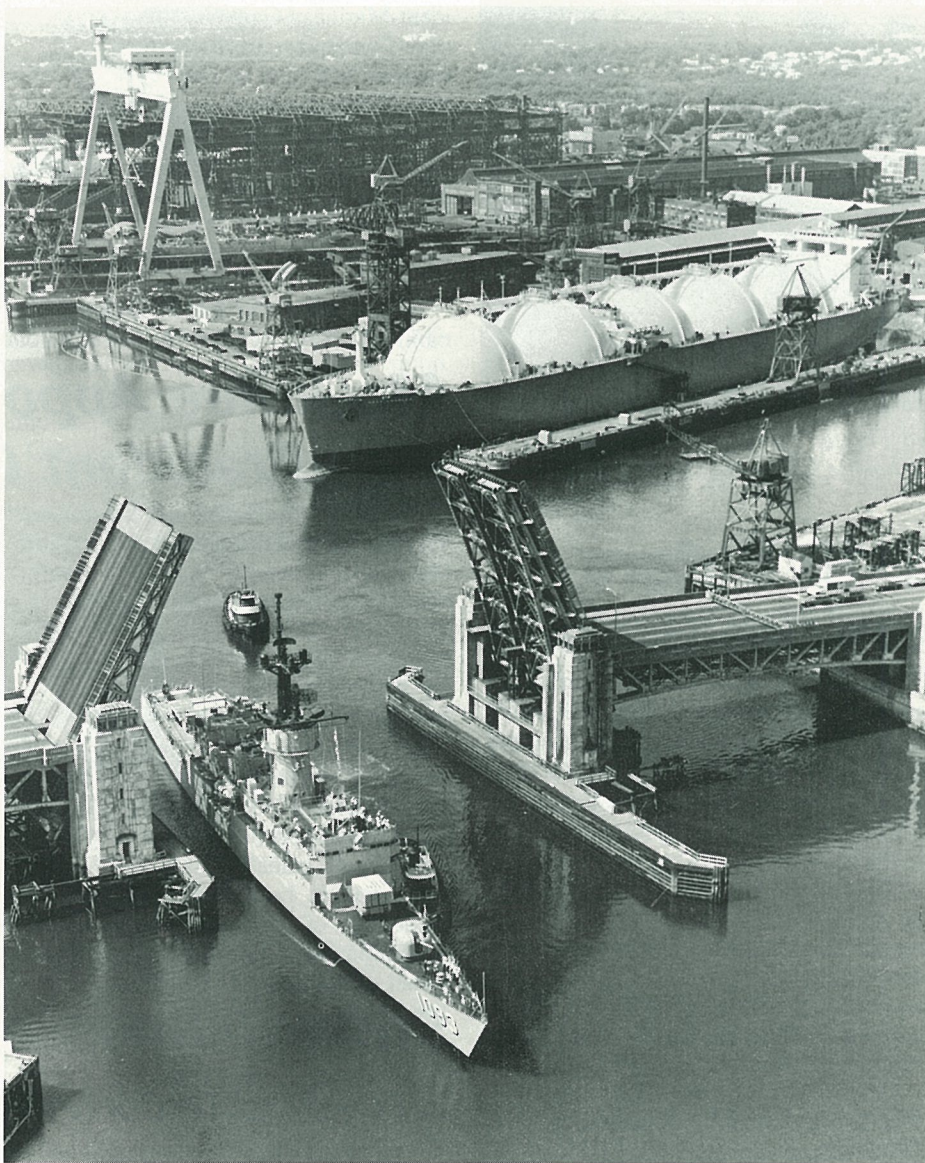
Beginning in mid-1981, two squadrons of F-16s will be assigned to Kunsan AB, South Korea, replacing 36 F-4D aircraft at Kunsan and 12 F-4D aircraft at Taegu AB. The F-4s will then be reassigned to the Air Force Reserve.

The Air Force announcement said that maintaining and operating 48 F-16s will require 300 fewer personnel than were previously required to support the F-4s.

Material Service Acquires Quarry

Material Service has acquired Hulcher Quarry in Nokomis, Ill., 45 miles southeast of Springfield. The limestone quarry produces agricultural and construction materials and finely pulverized limestone which is used as a dust suppressant in coal mines.

Jack Brown, from Material Service's Indian Point Plant, is temporarily coordinating activities at the quarry, which will be known as Material Service Yard 15.



Ready for Sea. The USS Capodanno (FF 1093) passes under the Fore River Bridge after receiving minor overhaul work at Quincy Shipbuilding (background). Liquefied natural gas tankers Lake Charles (right rear) and Louisiana (left rear) are visible at the shipyard.

Convair Division on Team For Prototype Fusion Reactor

A General Dynamics/McDonnell Douglas team has been selected by the Department of Energy to develop a prototype magnetic fusion reactor. Fusion energy has the potential to provide a virtually inexhaustible source of energy by the 21st century.

Convair Division will design, build and test 40 superconducting magnets and the operating electrical systems for the Elmo Bumpy Torus fusion reactor program for which McDonnell Douglas is the prime contractor. Convair's share of the four-year program could approximate \$15 million.

See Related Story Page 4

Each of the superconducting magnets built by Convair will be one meter in diameter. The magnets will form the heart of the fusion reactor facility that will be built near the Department of Energy's

Oak Ridge National Laboratory in Tennessee.

Dr. Ray Beuligmann, Director of Energy Systems at Convair, explained that fusion is the process of joining two hydrogen atoms together to form helium. Extremely high temperatures — 40 million degrees centigrade — are needed to complete the process.

"The fuel for fusion is abundantly available from sea water," he said, "and only small amounts of fusion fuel are needed to make very large amounts of energy."

Convair has on-going contracts to develop large superconducting magnets weighing up to 110 tons for other energy programs including fusion, magnetohydrodynamics and isotope separation. Dr. Beuligmann said that the subcontract from McDonnell Douglas is "Convair's first opportunity for multiple production in the superconducting magnet area."

Atlas-Centaur, Atlas F Boosters Face Busy Schedule Next Year

Seven Atlas-Centaur launches and an Atlas F launch are among the 18 space missions programmed for expendable boosters by the National Aeronautics and Space Administration (NASA) through the end of September 1981.

The busy schedule for the Convair-built space launch vehicles involves boosting weather and communications payloads sponsored by the International Telecommunications Satellite Organization (Intelsat), Comsat General Corp., the National Oceanic and Atmospheric Administration (NOAA) and the Department of Defense.

Atlas-Centaur activity begins in October 1980 when the reliable launch combination will boost a Fleet Satellite Communications (FltSatCom) payload into orbit for use by the Department of Defense. Atlas-Centaur will close out NASA's 1980 launch schedule in December when it is slated to launch an Intelsat V communications satellite.

In 1981, the Atlas-Centaur schedule includes a February launch of a Comstar communications payload, another FltSatCom in June and Intelsat missions in June and September. The Atlas F is scheduled to send a NOAA weather satellite aloft in May.

General Dynamics Increases Dividend, Splits Stock 2-for-1

The General Dynamics Board of Directors, meeting October 2d, voted to increase the quarterly cash dividend on the company's common stock by 20 percent and also voted a split of the common shares in a ratio of 2-for-1.

David S. Lewis, Chairman and Chief Executive Officer, said that on Nov. 17, 1980, the company will pay shareholders of record on Oct. 17, 1980, a quarterly cash dividend of 36 cents per share on the outstanding shares. This compares to 30 cents per share which was previously paid each quarter since February 1979.

Also on Nov. 17, the company will transmit to each shareholder one share of common stock for each share held by the shareholder on Oct. 17, 1980. Thereafter, the quarterly dividend will be paid at a rate of 18 cents per share on the total number of "old" and "new" shares.

The board also voted to pay the normal dividend of \$1.0625 on the company's Series A preferred stock, payable on Nov. 15, 1980, to shareholders of record on Oct. 17, 1980.

As previously reported, based on the company's estimate of earnings and profits for the current year, counsel for General Dynamics have advised that in their opinion, the dividends to shareholders of both the common and preferred stock paid in 1980 should not be taxable as ordinary income for Federal income tax purposes. The dividends will represent a return of capital and will reduce the tax basis of the shareholder's stock. It is expected that the dividends paid in 1981 will also represent a return of capital.

Harvey E. Kapnick Elected a Director Of General Dynamics

The General Dynamics Board of Directors has elected Harvey E. Kapnick Jr. as a Director of the corporation, according to David S. Lewis, Chairman and Chief Executive Officer.



Kapnick, 55, served as Chairman and Chief Executive Officer of Arthur Andersen & Co.

Kapnick

from 1970 until his retirement in 1979.

"Mr. Kapnick's strong background in management and finance will be of great value to our Board, and we look forward to his guidance and counsel," Lewis said.

From November 1979 to April 1980, Kapnick served as Deputy Chairman and a member of the Board of Directors of the First Chicago Corporation. He is currently a Director of Commonwealth Edison Company in Chicago.

A native of Palmyra, Mich., Kapnick was graduated from Cleary College, Ypsilanti, Mich., in 1947 with a bachelor's degree in business administration. He did graduate work at the University of Michigan Graduate School of Business and joined Arthur Andersen in 1948.

He is active in a number of professional, educational and community organizations, including the Museum of Science and Industry, the Dearborn Park Corporation, and the Menninger Foundation. He is also a Trustee of Northwestern University and a member of the Advisory Councils of Stanford Graduate School of Business and the University of Chicago Graduate School of Business.

F-16 to Participate In British Contest

The 388th Tactical Fighter Wing, first U.S. Air Force unit to fly the F-16 Fighting Falcon, has been selected by the Tactical Air Command to take part in an international bombing and strafing competition conducted by the Royal Air Force of Great Britain early next year.



Practice Fight. A pilot using the Advanced Fighter Technology Integration/F-16 simulator at Fort Worth tracks the image of a hostile fighter realistically projected in front of him.

Pilots Fly AFTI/F-16 Before It's Ready to Leave the Ground

Six pilots are now evaluating the Advanced Fighter Technology Integration (AFTI) F-16 aircraft in a computer-driven simulator that uses the same cockpit controls, displays and computers that will eventually be operated in flight.

The AFTI simulator's computers are programmed to duplicate everything the aircraft will do except leave the ground.

Through extensive testing, the simulator has proven that the AFTI/F-16 will—like its predecessor, the Control Configured Vehicle—provide precise pointing and flight path control to significantly improve conventional weapon effectiveness.

The aircraft will also ascend, descend and move sideways without changing from a level flight attitude.

"This simulator is not a trainer," says Gene Taylor, Simulator Element Manager on the Fort Worth program. "It is an engineering evaluation tool."

The cockpit simulator, housed in an enclosed hemisphere, offers the pilots realism that can be matched only in actual flight. In addition, potential system malfunctions are inserted during test missions to study and test redundant systems and to aid in flight safety.

"Everything that will be performed in the AFTI/F-16 flight tests will first be done on the simulator during the development stage," says Taylor. "If any problems are encountered in the air, we will try to duplicate them on the simulator to see what should be done to correct them."

Alex Wolfe, a General Dynamics test pilot; two U.S. Air Force pilots, Lt. Col. Dave Milam and Maj. Harry Heimple, who regularly fly the F-16 Fighting Falcon; Lt. Cmdr. Winston Copeland, a U.S. Navy pilot, and Bill Dana and Steve Ishmael of the National Aeronautics and Space Administration have been assigned to the AFTI program.

New technologies are being developed in the program that was begun after Fort Worth was awarded an Air Force contract in December 1978. Among them are advanced maneuvering capabilities, digital flight controls and an integrated flight and fire control system.

Results from the far-reaching program will be made available, under terms of the contract, to the United States aircraft industry so the newly proven technologies may be applied in the design of future generations of fighters.

Last March, the Air Force returned a full-scale development F-16 to Fort Worth to be modified into an AFTI/F-16. That aircraft is now in an area that is about 50 yards from the simulator dome and is scheduled to fly next year.

Meanwhile, work began on the simulator in April 1979. A projection system inside the dome throws an image of the earth and sky on the spherical walls. Images of threat fighters, ground targets and airfields are also projected.

Most fighter pilots can get in the simulator and "do anything they could do in an airplane," Taylor says. "They can get in, release the brakes and take off, fly a mission, then come back and land."

"There is a full simulation of aerodynamics, including stall and spin... it's the next thing to flying."

Dr. James E. Ashton Appointed EB Assistant General Manager

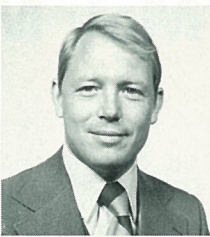
Dr. James E. Ashton has been appointed Assistant General Manager-Engineering for Electric Boat Division.

P. Takis Veliotis, Executive Vice President-Marine of General Dynamics and General Manager of the Electric Boat Division, in announcing the appointment, said that Dr. Ashton will succeed Spencer Reitz, who last month was appointed Deputy General Manager of Electric Boat.

Ashton, 38, who joined General Dynamics in 1967, comes to Electric Boat

from Fort Worth Division where he was serving as Vice President-Production. He previously held positions of increasing responsibility in engineering, planning and manufacturing at Fort Worth, after serving for two years as engineering director of structures and design at the Convair Division in San Diego.

A native of Davenport, Iowa, Ashton holds a Bachelor of Science degree in Civil Engineering from the University of Iowa, a Master of Business Administration degree from Harvard Business School and received his doctorate in structural mechanics from Massachusetts Institute of Technology.



Ashton

McGuffee Appointed Fort Worth Vice President Of Production

Robert W. McGuffee has been named Vice President-Production at Fort Worth. McGuffee succeeds James E. Ashton, who has been named Assistant General Manager - Engineering at Electric Boat in Groton, Conn.

McGuffee, 60, has been serving as Vice President-Logistics and Support at Fort Worth since January 1977. In his new position, he will be responsible for production of the F-16 Fighting Falcon, other Fort Worth-built aircraft and associated manufacturing activities.

McGuffee, who joined the company in 1941, held a number of increasingly important positions at Fort Worth and was Vice President-Operations in 1974 when he was appointed Manager of the Electric Boat Division's Quonset Point, R.I., facility.

With the transfer of McGuffee, Rolf Krueger, Director of Logistics, and William B. Rose, F-16 Deputy Program Director-Integrated Logistics Support, who previously reported to McGuffee, will now report directly to Richard E. Adams, Corporate Vice President and General Manager of the Fort Worth Division.



McGuffee

Stromberg Realigns Organization, Gives Executives New Positions

Stromberg-Carlson announced an organization realignment and new executive appointments that will position the company to respond more effectively to changes in the telecommunications marketplace.

The realignment creates four new operating centers that will enable Stromberg-Carlson to maximize activities in its major markets: telephone operating companies, government organizations, private business sectors and a new advanced systems engineering, technology and services center.

Dr. John C. Redmond will serve as Vice President and will be in charge of the Engineering Development Center, located in Longwood, Fla. This center is responsible for advanced switching development, systems engineering and engineering technology and services.

Kenneth S. Hoyt, as Vice President and General Manager of the Public Switching Center, will consolidate management of the company's public switching activities in Rochester, N.Y., Ardmore, Okla., and central Florida.

Wilfred G. Sardelli will serve as Vice President of the Government Systems Center, which has the resources to satisfy the government's requirements for specialized state-of-the-art systems and military communications systems.



Redmond



Hoyt



Sardelli



Baker

Philip B. Baker assumes the post of Vice President of the Business Communications Center and will be responsible for the company's Digital Branch Exchange product line and related business communications systems.

"The new structure allows Stromberg-Carlson to be more responsive to current and potential business opportunities," said Frederick F. Jenny, President of Stromberg-Carlson. "Stromberg is a customer-driven organization and major supplier of digital telecommunications systems. This restructuring enables us to effectively concentrate our resources and better satisfy our customers' needs."

Orrie Hiatt Named To Dayton office

Orrie G. Hiatt Jr., Corporate Manager—U.S. Military Aircraft Programs in the Washington DC office, has been appointed Manager of General Dynamics' Corporate Field Office in Dayton, Ohio.

Hiatt succeeds W. L. Godsey, who is now Corporate Director—Europe for GD's international marketing operations.

A native of Baltimore, Md., Hiatt joined GD in 1964 at Fort Worth where he served as a Senior Logistical Engineer and pilot. After eight years at Fort Worth, he was transferred to the Dayton office where he fulfilled aircraft-related assignments, with emphasis on the F-16. He was assigned to the Washington office in 1975.

Hiatt was graduated from the U.S. Naval Academy in 1957 with a Bachelor of Science degree in Engineering and did graduate work at Texas Christian University. Before joining GD he served as a Navy fighter pilot.



Hiatt

Savings And Stock Investment Values			
	August 1978	August 1979	August 1980
Salaried			
Government Bonds	\$ 2.0314	\$ 2.2061	\$ 2.4357
Diversified Portfolio	1.3732	1.5515	1.9194
Fixed Income	—	1.0158	1.1167
Hourly			
Government Bonds	2.0304	2.2063	2.4335
Diversified Portfolio	1.4041	1.5872	1.9580
GD Stock	\$34.8400*	\$41.8750	\$71.6250

* Reflects 2½ for 1 stock split

300 Women at Pomona Attend Career Seminar

Emphasizing that "you are your product," Ilene Smith, a university professor, told 300 women at Pomona's Personal Growth for Career Development Seminar that women must set definite career goals and then prepare themselves to reach those goals.

Smith, a professor of marketing at California State University, Los Angeles, told the attendees at the seminar that they must begin immediately on a plan of action to prepare themselves to capitalize on career opportunities.

Another speaker, Rick Wall, Pomona's Manager of Estimating, told the participants in the seminar there is a

need for women who have excelled professionally to offer more help to talented women in the beginning of their careers.

"Throughout my business life, I have observed male professionals coaching their subordinates," he said. "Some call this 'grandfathering.' If my perceptions are correct, I don't think women professionals who have excelled, 'grandmother' the less experienced female talent in the same way."

The day-long seminar was sponsored by the Pomona Chapter of the National Management Association and the division. A committee comprised of personnel from Operations, Engineering and Administration organized the meeting.



Making History. A Convair XF2Y-1 Sea Dart is shown in an early photo during a high-speed taxi test on San Diego Bay.

Volunteers Refurbish Sea Dart To Revive Part of Convair's Past

Dozens of volunteers, many of them retired Convair employees, spent many weekends this past spring and summer in a labor of love—refurbishing the last remaining XF2Y-1 Sea Dart for its turn-over to the San Diego Aerospace Museum.

Working under the direction of Frank Signorelli, Convair's Assistant Program Director of the 767 Strut Program, the volunteers spent their weekends stripping the exterior of the aircraft to remove the corrosion caused by almost three decades of neglect.

Nearly 30 years ago, in April 1953, the strange-looking twin-jet airplane was taken from Convair's manufacturing plant to the waters of San Diego Bay, where it became the world's first jet-powered seaplane, a craft which, in the words of Convair's press release at the time, combined "the speed of jet fighters with the versatility of water-based planes."

The Sea Dart, an experimental plane built for the U.S. Navy, had a delta wing and a large tail similar to the company's F-102 Delta Dagger interceptor, which was under development at the same time; but the Sea Dart had retractable hydro-skis to allow takeoffs and landings on water.

Adm. Walter Locke Awarded Highest Peacetime Medal

Rear Adm. Walter M. Locke, Director of the Joint Navy/Air Force Cruise Missiles Project, has been awarded the nation's highest peacetime decoration during ceremonies at the Pentagon.

In early October, Adm. Locke was presented the Defense Distinguished Service Medal by Dr. William J. Perry, Under Secretary of Defense for Research and Engineering, on behalf of Secretary of Defense Harold Brown.

The admiral was cited for outstanding management and superior engineering ability in directing the acquisition of strategic, theater nuclear and conventional weapons systems.

The admiral, who is known as "the catalyst of cruise missile development," was named to his current post in 1977. Before that, he was Project Manager for the U.S. Navy's Tomahawk Cruise Missile Program at Convair.

His military experience includes flight testing naval aircraft, duty aboard a destroyer and serving as an aircraft carrier fighter pilot.

Locke began his career as a Naval Reserve seaman, and, in 1948, was appointed to the U.S. Naval Academy, Annapolis, Md. He earned his Bachelor of Science degree in Engineering from the Academy in 1952, and, in 1954, qualified as a Navy aviator.

Four of the aircraft were built for the test program, but only one Sea Dart has remained, sitting on the Convair ramp gradually surrendering to the ravages of time and weather.

Convair donated the aircraft to the museum several years ago, and when the museum had space for it, Signorelli took charge of the task of rehabilitating it for display.

"It was surprising how many retired Convair employees wanted to work on the project once they found out we were doing it," Signorelli says. "Even though we only worked on weekends, we had the whole job done in about four months."

Now repainted in its original Navy blue and with insignia as before, the Sea Dart sits proudly on the Convair ramp waiting its journey to the museum.

Hawes Receives Golden Knight From College

The Clarkson College of Technology Alumni Association has presented Pomona Division General Manager Ralph E. Hawes its Golden Knight Award, the association's highest commendation for an alumnus of that college.

According to Donald Dangremond, Clarkson's Director of Alumni Relations, the Golden Knight is presented to a select number of Clarkson alumni each year.

"The award recognizes professional excellence and personal achievement," Dangremond said. "Mr. Hawes' selection was based upon his professional, academic and civic accomplishments."

The Clarkson College of Technology, located in Potsdam, N.Y., is one of the leading engineering colleges on the East Coast. Hawes was graduated in 1955 with a bachelor's degree in electrical engineering.

He began his career at General Dynamics in 1956 as a senior electronics engineer and served in a number of increasingly responsible positions before he was named Pomona General Manager in 1977. He served as Program Manager of the Standard Active Missile System from 1971 to 1973 and as Vice President of Research and Engineering at Pomona Division from 1973 to 1977.

In May 1978, Hawes was elected Vice President of General Dynamics.

Since joining General Dynamics, Hawes has earned a master's degree in engineering from University of California at Los Angeles (UCLA). He also studied international and business economics at the Claremont Graduate School.

Hawes is Vice President of Air Systems of the Technical and Management Advisory Service of the American Defense Preparedness Association, a member of the American Institute of Aeronautics and Astronautics and a member of the National Aeronautic Association.

He also serves on the UCLA Dean's Committee and the California Polytechnic School of Science Dean's Advisory Council. He is a member of the Galileo Society of Harvey Mudd College in Claremont, Calif., and serves on the Old Baldy Executive Council of the Boy Scouts of America.

Pomona Builds Multilayered Circuit Boards For the F-16

Pomona is using its experienced capability in producing printed wiring boards for Fort Worth's F-16 Fighting Falcon.

The cooperative relationship is paying off for both divisions. Fort Worth is spared the expense of building a wiring board fabrication facility while Pomona's Printed Wiring Board Fabrication Department's workload is balanced by a long-term contract.

For the F-16 program, Pomona produces 58 different types of the boards, which are layered epoxy plates inlaid with detailed circuitry to carry electronic impulses. These boards are installed in the stores management and flight control systems of the sleek new fighter.

Pomona, which has been producing printed wiring boards for its own weapon systems since 1956, won the F-16 contract in 1978 after the contract was put out on open bid.

"We were selected for the F-16 job because our facility is uniquely equipped to build complex multilayered boards to the required specifications," says Mike Oliveri, Manager of the Printed Wiring Board Fabrication Department.

Many boards produced for the F-16 are 8 to 14 layers thick. Drilling minute holes through these layers of copper circuitry without breaking out of the circuit path often demands tolerances as tight as two thousandths of an inch through all 14 layers. For this reason, the boards for the F-16 are made of a special material and require a special epoxy etching process which gives the boards the necessary properties to hold tight tolerances during production.

Since production began at Pomona, the department has produced over 65,000 F-16 boards. Over 27,000 additional F-16 boards are scheduled for production through 1981.

Carrier Named International Marketing Director

Francis A. Carrier has been appointed Director of International Marketing for Pomona.

Carrier joined the division in 1974 after completing a 30-year career with the U.S. Navy, retiring with the rank of captain. At Pomona, he has been an International Marketing Manager and Assistant Director-International Marketing.

Carrier was graduated from Holy Cross College, where he earned both a bachelor's degree and a master's degree in chemistry, and from the Navy Post Graduate School, where he received a master's degree in international relations.



Close Look. Ann Cameli, a circuit board fabricator at Pomona, completes etching touch-up on an F-16 circuit board. Following this procedure, all boards are electronically tested to assure all circuits operate properly.

Completed boards are sent to Fort Worth and European coproducers where they are assembled into finished circuit card assemblies and electronic units.

Supporting aircraft production at Fort Worth is nothing new to many Pomona employees, including Jeff Stevenson, Pomona's special projects program manager, who is charged with directing the program.

"We have a long-standing relationship with Fort Worth dating back to the mid-'60s when we built the systems for the F-111," says Stevenson. "We performed well then and we have continued to build on that performance with the F-16."

J. Copeland Named Base Manager At Vandenberg AFB

James Copeland Jr. has been named Base Manager for Convair Operations at Vandenberg AFB, Calif. He replaces Kenneth E. Newton, who retired.

Copeland will be responsible for the refurbishment and modification of Atlas launch vehicles and Atlas launch operations from Vandenberg in support of U.S. Air Force and National Aeronautics and Space Administration programs.

Copeland began his career with Convair in 1956 at Edwards Rocket Base, Calif., as a Flight Test Engineer. He moved to Vandenberg in 1959 as Assistant Test Conductor and subsequently served as Chief of Projects, Site Manager and Test Conductor.



President's Inspection. Oliver C. Boileau (center), General Dynamics' President, talks with Helen Shelley (left), a Production Supervisor at Stromberg-Carlson's Lake Mary plant, and Betty Bowers, a wire wrap machine operator, during his inspection of the plant with Guy W. Fiske, General Dynamics Executive Vice President-Commercial. Boileau toured facilities and received briefings during his September visit to Lake Mary, the Engineering Development Center at Longwood and Stromberg-Carlson's Tampa headquarters.

GD World

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Manager of Internal Communication
G. Alexander Smith

GD Explores Energy Production Using Superconducting Magnets

The selection of the General Dynamics/McDonnell Douglas team to build a prototype magnetic fusion reactor for the Department of Energy is the latest contract Convair has received in the field of energy production.

For a number of years, Convair has been working on large superconducting magnet systems that could generate magnetic fields indefinitely and could possibly be the answer to our nation's future energy requirements.

Convair is working on three superconducting magnets for fusion, magneto-hydrodynamic (MHD) and isotope separation systems for energy production.

See Related Story Page 1

According to Dr. Ray F. Beuligmann, Convair Program Director for Energy Systems, superconductors are certain alloys and compounds which lose all electrical resistance when cooled to very low temperatures. Because of this characteristic, large superconducting magnets can generate large magnetic fields indefinitely with minimal sustaining power.

Dr. Beuligmann says Convair has nine superconducting magnet contracts, four of which cover both design and fabrication. The others are for analysis and design.

"The preprototype magnet system for isotope separation and the large coil program for fusion energy development have both reached the fabrication stage," he said. "Fabrication on the MHD magnet program will begin early next year."

In the isotope separation program, Convair is designing and building a large superconducting preprototype magnet system for TRW. The system includes a 37-ton magnet and supporting subsystems. The magnet is being wound and assembled at the company's Harbor Drive facility and will be delivered to the customer early next year.

Beuligmann says advanced isotope separation systems may significantly reduce the cost of producing enriched nuclear fuel and allow use of the uranium tailings left from the existing uranium separation plants.

He pointed out that the use of an MHD system on a conventional coal-fired plant would increase our ability to extract energy from a unit of fuel by about 50 percent. MHD systems work this way: magnetic fields are used to separate the positively and negatively charged particles as the gases pass through the magnet. This reaction creates a voltage potential that enables direct generation of electrical power. The exhaust gases from the MHD channel are then directed to a boiler for conventional steam power generation.

The MHD work at Convair is being done under a contract with the Francis Bitter National Magnet Laboratory at Massachusetts Institute of Technology for the Stanford University Gas Dynamics Laboratory. The magnet will be used to investigate the effect of high magnetic fields on plasma (hot gas) stability.

Commercially sized MHD magnets envisioned for the electrical utilities in the 1990s will weigh upwards of 1,000 tons and will therefore have to be built on-site. The MHD work Convair is doing involves a 90-ton magnet. Manufacturing for the MHD program will also be done at the Harbor Drive facility.

In the 21st century, Beuligmann says, magnetic fusion may provide a virtually inexhaustible source of energy. "Magnetic fields are used to contain a plasma of deuterium and tritium (isotopes of hydrogen) to cause fusion reactions," he said. "Just one gram of deuterium-tritium fuel can produce the energy equivalent of 45 barrels of oil." Fusion reaction generates heat that subsequently could be used in a steam plant to generate electricity.



Home Again. USS Groton passes her birthplace at Electric Boat Division on the Thames River after completing an around-the-world cruise.

Groton Welcomes Its Namesake After an Around-the-World Voyage

It was a colorful homecoming for a ship—a waterborne version of a ticker tape parade ending with hurried official greetings, then hugs and kisses at the dock.

And when the Electric Boat-built SSN 688-class fast-attack submarine USS Groton moored at the Submarine Base on October 6th, the community for which she's named gave her crew members no doubt that they'd been missed during the sub's six-month cruise around the world.

There were shouts of, "There he is! I can't believe it!" from wives and sweethearts, a shrill "Hi, Daddy!" from youngsters. There were tears of joy, too, as the crowd on the dock surged forward to embrace crew member relatives. The music of Groton's Fitch Senior High School Band completed the scenario.

"It's wonderful to be back," said U.S. Navy Cmdr. George W. Emery, Groton's skipper, into a battery of microphones set up on a podium in the middle of the pier. Behind him were tables loaded with cakes and champagne.

A strong wind cutting in across the dock didn't dampen his enthusiasm any. Cmdr. Emery called the ship's performance during the voyage "superb" and "virtually flawless—we had no problems

throughout the cruise." He also termed Groton "a very comfortable boat."

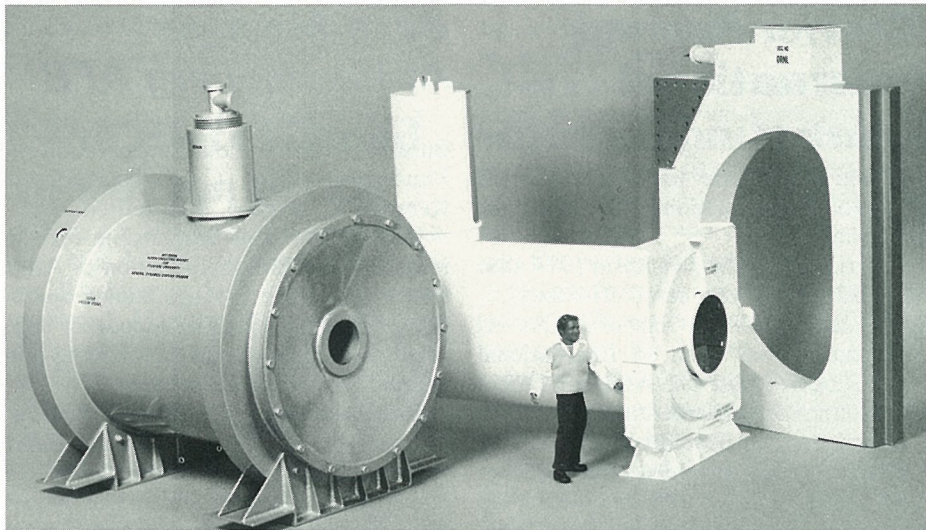
Emery said the sub remained submerged "roughly five-sixths of the time."

While in the Pacific, Groton made a stop at Perth, Australia, then returned to the Atlantic Ocean through the Panama Canal.

The ceremonial homecoming began when Groton entered the Thames River about 1:45 p.m. and was joined by several small craft, a Navy tug and EB's tug, Hacksensack. As she passed by Electric Boat, crane and ship whistles hooted, and shipyard workers, some of whom helped build the ship, waved a cheery greeting.

The ship continued on up the river the three miles to the Sub Base and docked five minutes before her scheduled 3 p.m. arrival time. As she nosed into the pier, assisted by a tug, balloons released on the shore flew in the wind the length of her hull. Minutes later the gangway was secure, and Groton was home.

The 360-foot, 6,900-ton vessel is the seventh in the Navy's class of Los Angeles fast-attack submarines. She carries a complement of 12 officers and 115 enlisted men and was commissioned July 11, 1978.



Model Superconductors. Shown are scale models of three magnet systems being manufactured by Convair. The isotope separation system (center) is flanked by an MHD magnet (left), and the large coil fusion magnet.

Contracts with Minority Vendors Totalled \$29 Million Last Year

Purchasing departments across General Dynamics increased the value of the corporation's orders placed with minority vendors to \$29 million in 1979, compared to \$18 million in 1978.

Since 1975, General Dynamics purchasing agents have been actively seeking minority vendors to supply goods and services to the corporation. The Federal government encourages defense contractors to utilize minority vendors and, in 1978, legislation directed government contractors to plan and report on these activities. General Dynamics has not only met the intent as well as the letter of the new law, but has extended this policy to its commercial operations as well, according to Everett C. Gray, GD's Minority Purchasing Manager.

"Our policy of increasing our sources of supply by searching for, and providing, competitive opportunities to minority

businesses has proved to be very sound," says Gray. "Having additional suppliers bid on our business increases competition and ensures a fair price for the goods and services we need. This is one area where both the business and social objectives of our firm can be served effectively. It makes good business sense."

Minority businesses are usually small businesses that are owned by members of minority groups, and GD's purchasing departments have found many qualified suppliers of a great variety of products. A few examples include:

A minority firm sells safety glasses and protective clothing to Electric Boat.

Another has supplied floor covering to Fort Worth.

A minority contractor is a source for power supplies for Stromberg-Carlson, while Pomona purchases highly technical microwave equipment and hand tools from minority contractors.

VOTE

November 4, 1980

Around the World... ...in GD

Convair: Daniel T. Kuczon and Jack G. Fisher were promoted to Engineering Chief... Jack L. Wolff joined as Project Engineer, Senior.

Electric Boat: John W. Hardink was promoted to Chief-Employee Benefits.

Quincy: Arthur G. Teel joined as Machine Shop Superintendent... Nicholas M. Baker transferred from Pomona and was promoted to Director-Marketing Commercial Marine.

Fort Worth: Harold W. Blackmon was promoted to Assistant Project Engineer... Michael J. Eagleston was promoted to Chief, Estimating... Edward K. Hensley was promoted to Manager, Engineering Personnel Services... Lester G. Lemay joined as Chief, Quality Assurance... John G. Beauregard joined as Engineering Staff Specialist... Gordon W. Fenn joined as Assistant Project Engineer.

ATC: Jimmie M. Sears joined as Regional Sales Manager.

Pomona: William G. Michel joined as Manager, Maintenance... Donald B. Wilson was promoted to Production Manager-Camden Plant.

GDCC: Gerald L. Smith was promoted to Region Manager-San Francisco Region.

Stromberg-Carlson: Maynard K. Knapp was promoted to Manager, Engineering... Richard I. Subrin was promoted to Supervisor, Engineering Group 1.

GDSC: David N. Kahler was promoted to Manager, Estimating.

Quincy to Build Coal-Carrying Ship for Utility

Plans have been announced for Quincy Shipbuilding to build a 655-foot coal-carrying ship for New England Electric System, a holding company based in Westborough, Mass.

The \$60 million vessel is the first of its type to be built in the United States in over 25 years. It will become operational in 1983 and will transport 2.2 million tons of coal annually from ports on the Eastern Seaboard to New England Electric's power generating facilities, including Brayton Point Station in Somerset, Mass.

Plans for the ship were announced October 31st at Quincy by Guy W. Nichols, New England Electric's Chief Executive Officer.

"We are pleased to be the first company in nearly a quarter century to order a coal-carrying ship," Nichols said. "Quincy is an appropriate place for this occasion, for with the construction of this ship, we take a step toward independence—energy independence. By signing the document to build the ship in Quincy, we are taking the first key step toward a coal-fired ship. The ship will burn United States coal, move United States coal and will be built by New Englanders for New Englanders."

The ship will be 95 feet wide and have a draft of 32 feet. It will carry 36,000 tons of coal per trip and is designed to travel at approximately 15 knots. Work is scheduled to begin in January 1981, and the ship is to be completed in 1983.

The coal carrier will be the first coal-fired, steam-turbine vessel to be built since 1953. The machinery plant will feature mechanical stoker and ash disposal systems and will incorporate the latest technology in coal boilers. Its self-unloading system will allow the ship to discharge its cargo of about 36,000 tons of coal in 11 hours.

Once in operation, the ship will carry domestic coal from ports on the Eastern Seaboard to southern New England. The coal will be used to generate electricity for more than one million customers of Massachusetts Electric, Narragansett Electric in Rhode Island and Granite State Electric in New Hampshire, subsidiaries of the holding company.

The increased use of coal is one of the major factors in New England Electric's 15-year energy plan, which has the goal of reducing the company's dependence on foreign oil to less than 10 per cent of its total energy requirements.

During the ceremony in which plans for the ship were announced, Nichols praised the efforts of Rep. Brian J. Donnelly, Democrat of Massachusetts, to sponsor legislation that allows domestic coal-carrying ship priority loading rights at coal terminals.

Continued on Page 2

GD World

Vol. 10 No. 11

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GD Earnings Set a Record For 3d Period

General Dynamics' earnings for the third quarter of 1980 were \$51.7 million, or \$1.90 per common share, a new high for the period. Earnings in the same quarter of 1979 were \$50.1 million, or \$1.86 per share.

Sales for the third quarter of 1980 were \$1.20 billion, compared to the \$1.06 billion reported for the same quarter last year.

Earnings for the first nine months of 1980 were \$142.4 million, or \$5.24 per share, on sales of \$3.45 billion, both records for the period. Earnings for the first nine months of 1979 were \$127.4 million, or \$4.71 per share, on sales of \$2.97 billion.

The earnings include investment tax credits of \$5.3 million, or 20 cents per share, for the third quarter and \$10 million, or 38 cents per share, for the nine months, attributable to the delivery of two liquefied natural gas (LNG) tankers to Lachmar, the partnership organized by General Dynamics, Panhandle Eastern Pipe Line Company and Moore McCormack Resources to transport LNG from Algeria to the U.S. Gulf Coast.

The earnings for the 1980 periods reflect a benefit of \$5.5 million, or 21 cents per share, resulting from a permanent deferral of Federal income taxes on profits derived from certain export sales.

All earnings per share amounts have been computed on the weighted average shares outstanding for the respective periods and do not reflect the recent 2-for-1 split of the common shares which became effective on November 17, 1980.

Funded backlog at the end of the third quarter was \$10.6 billion, and total funded and unfunded backlog was \$11.4 billion.

"Operating results for the third quarter continued to be mixed," said David S. Lewis, General Dynamics Chairman and Chief Executive Officer. "In general, our government business showed improvement as production levels increased on several major programs, while most of our commercial activities slowed down as a result of the weak national economy."

In the resources group, Freeman United Coal showed improved sales and earnings for the third quarter, Lewis said, while sales and earnings were down in the company's other resource operations as well as in the company's telecommunications manufacturing subsidiaries.

Continued on Page 2



For Export. The F-16/79 intermediate export fighter makes a flight over the Fort Worth plant (above) and lines up on the Fort Worth flight ramp with an F-16B (below).



F-16/79 Intermediate Fighter Begins Evaluation Program

Fort Worth's new F-16/79 intermediate export fighter made its first flight on October 29th, three days ahead of schedule, initiating a series of performance evaluation flights which will take place over the next few months.

The aircraft, powered by the 18,000-pound-thrust General Electric J79-17X turbojet engine, was flown on its maiden flight by F-16/79 Program Test Pilot James A. McKinney. McKinney has logged 400 flight hours in the standard F-16, which is powered by the 25,000-pound-thrust class Pratt & Whitney F100 turbofan engine.

Approximately 50 flights are planned for the aircraft during the test period. The flights will be made at both Fort Worth and Edwards AFB, Calif., with Edwards to be used for engine air start, high angle-of-attack and low altitude supersonic testing.

The F-16/79 was designed under a company-funded program to fulfill the requirements for an export fighter with cost and performance characteristics that lie between the current U.S. export fighter, the F-5E Tiger II, and the standard F-16 Fighting Falcon, currently in operational service with the U.S. Air Force and five

allied air forces in Europe and the Middle East.

General Dynamics has received approval from the U.S. Government to present F-16/79 performance details to the governments of 16 countries which have a requirement for an intermediate fighter aircraft.

The two-seat F-16/79 uses an airframe produced for the F-16 full-scale development program, which was completed in 1979. General Dynamics leased the aircraft from the USAF and made the modifications required to convert the aircraft to the F-16/79 configuration.

The modifications include the installation of a new fixed ramp inlet to tailor airflow to meet the J79 engine's specific requirements and some minor structural changes to accommodate the engine, which is 18 inches longer than the F100 engine.

The J79/17X engine was developed specifically for the F-16/79 and is a derivative of the J79-17C engine which powers the F-4 Phantom aircraft used by nine countries. J79 engines have logged more than 28 million engine flight hours during more than 25 years of operations.



Coal Carrier. Massachusetts Governor Edward J. King (center) and Guy W. Nichols, Chairman and Chief Executive Officer of New England Electric (right), discuss the \$60 million coal-fired ship which the utility plans to have built at Quincy with Gary S. Grimes, General Manager of Quincy Shipbuilding.

Atlas/Centaur Boosts Fourth FltSatCom

A Convair-built Atlas/Centaur rocketed away from Cape Canaveral's Complex 36-A late last month to send a Fleet Satellite Communications (FltSatCom) spacecraft into orbit for service over the western Pacific Ocean.

See Photo Page 4

Despite a 30-minute delay because of high winds aloft, the launch was "very precise" with the launch vehicle doing a "beautiful job," according to Bob Benzwi, Convair's FltSatCom Mission Manager. "The mission was flawless in all aspects," Benzwi said, "including satisfactory separation of the satellite from Centaur and eventual insertion of the payload into synchronous orbit."

The satellite was first positioned in a highly elliptical orbit. Later the satellite's solid propellant kick motor was fired to circularize the spacecraft's orbit over the Equator. The FltSatCom, which has a design life of five years, will provide two-way communications between any two points on Earth visible from its orbital location.

The Atlas booster was erected on the pad at the Cape Canaveral Launch Complex 36 on July 15th. The interstage adapter was mated with the booster on July 16th and the Centaur upper stage was erected atop the stack on July 17th. The spacecraft and payload fairing assembly were mated with the launch vehicle two weeks prior to launch.

This was the fourth launch in a series of five FltSatComs planned by the Department of Defense. The fifth will be launched next summer by another Atlas/Centaur vehicle. The FltSatCom satellites are part of a worldwide U.S. Navy, U.S. Air Force and Department of Defense communications system designed to provide extensive communication between naval aircraft, ships, submarines, ground stations, Strategic Air Command elements and the presidential command network.

Last month's launch was the 53d for Atlas/Centaur and the second in 1980. Earlier in the year the third FltSatCom was successfully launched.

Quincy to Build Coal Carrying Ship for Utility

Continued from Page 1

"This legislation is expected to save up to 30 days and half a million dollars each trip," Nichols said. "Without these savings, this project would not be economical."

Also at the ceremony, Massachusetts Governor Edward J. King said, "I support the return of the coal-fired vessel as another creative means of reducing dependence on foreign oil as a fuel source. Building such a ship here in Massachusetts also will benefit the people of the Commonwealth by creating more than one thousand jobs, keeping our energy costs down and making our energy supplies more secure."

The ship will be operated by Keystone Shipping Co. of Philadelphia as a part of a joint venture agreement with New England Energy Inc.



Greek Exhibition. Athanasios Leris(center), Senior Business Planner at the General Dynamics International office in Athens, Greece, distributes literature on the corporation and its products to military officers during Defendory Expo '80, an international exhibition of defense systems and equipment held in Athens in October. The GD exhibit used models and photographs to portray the diversity of the corporation and its products.

Quality Circles Are Planned At GD Plants Across Country

Representatives from Convair, Electronics, Fort Worth, DatagraphiX, American Telecommunications, Stromberg-Carlson and Electric Boat's Quonset Point Facility met at Pomona Division in late October to learn about Quality Circles and how they might be used to increase worker participation and productivity.

Quality Circles are groups of 7 to 13 employees who work in the same area and meet regularly to solve departmental problems. Management works closely with these groups, evaluating recommendations and explaining factors that affect the group's recommendations.

Pomona Quality Circles personnel have already started a training session at Quonset Point Facility, taking the first steps toward setting up Quality Circles there. A

similar training session is scheduled for January on the West Coast involving employees at Convair, Electronics, DatagraphiX and Fort Worth.

In a recent speech, General Dynamics' President Oliver C. Boileau talked of the success of Quality Circles and the possibility of expanding the program.

"For more than 20 years, the Japanese have been using Quality Circles to great advantage. A few months ago, General Dynamics began an experimental program at Pomona Division. In a very short period of time, all the circles contributed ideas to improve their departments' performance; the quality consciousness of these groups is absolutely astonishing. Now we are looking at ways of expanding the program throughout the corporation."

GD Earnings Set a Record

Continued from Page 1

Quincy Shipbuilding showed a substantial decrease in sales and earnings during the 1980 third quarter as work was completed on the 10th and last of the LNG tankers under contract.

"Long-term prospects for Quincy brightened considerably in October when provisional contracts were received for six LNG tankers to transport gas from Indonesia to the U.S. West Coast," Lewis said. "We are encouraged by these orders despite the fact that construction go-ahead could be delayed for some time until regulatory approvals for the LNG receiving station are obtained from California agencies and ship financing is approved by the U.S. Maritime Administration."

Meanwhile, Lewis said, Quincy has been successful in obtaining other new U.S. Navy and commercial contracts which will provide employment for the nucleus of skilled workers at the shipyard. The most recent major award was a contract for a \$60 million coal-carrying ship for the New England Electric System on which work is scheduled to begin in early 1981.

At Electric Boat, work continued to accelerate on the giant Trident missile

submarines, resulting in increased sales and earnings for the third quarter of 1980 compared to the same period of 1979. The first of the Trident submarines, the *Ohio*, is scheduled for delivery to the Navy in mid-1981 and accelerated deliveries of SSN 688-class fast-attack submarines are scheduled in 1981. These revised schedules reflect the resolution of certain problems including welding and discrepant steel. Lewis said that the company expects to recover most of the costs incurred in resolving those problems and the delay resulting from problems with government furnished equipment.

In the aerospace group, sales and earnings were up at the Pomona, Fort Worth and Electronics divisions while Convair showed a decline.

"Pomona increased production levels on several major tactical missile and gun systems, and Fort Worth continued to do a fine job in maintaining on-cost and on-schedule performance on the important F-16 program," said Lewis. More than 270 F-16s are now in operational service with six air forces, and the delivery rate from the Fort Worth and European production lines has reached a total of 22 aircraft per month.

The first flight of the F-16/79, the proposed intermediate export version of the F-16, was made on October 29th, beginning a comprehensive series of performance evaluation flights which will be conducted over the next few months. "The company has received approval from the U.S. Government to present F-16/79 performance details to the governments of 16 countries, and is following up requests from some of these countries for briefings on the aircraft," Lewis said.

EB to Launch 688-Class Sub In December

The fast-attack submarine *Baltimore* (SSN 704) will be christened by U.S. Rep. Marjorie S. Holt, Republican of Maryland, December 13th at Electric Boat Division.

Rep. Holt will smash the traditional bottle of champagne on the bow of the submarine during noon launching ceremonies.



Mathias



Holt

U.S. Sen. Charles McC. Mathias Jr., Republican of Maryland, dean of Maryland's Congressional delegation, will deliver the principal address.

Rep. Holt was the first woman elected to Congress from Maryland in a general election. She is a member of the House Armed Services Committee, where she is the ranking Republican on both the Personnel and Procurement and Military Nuclear Systems Subcommittees. She is also a member of the House Budget Committee.

Sen. Mathias serves on the Senate's Appropriations, Governmental Affairs, Judiciary and Intelligence Committees. He is currently the ranking minority member of several subcommittees — among them the Criminal Justice Subcommittee of the Judiciary Committee and the Charters and Guidelines Subcommittee of the Intelligence Committee.

The 360-foot, 6,900-ton *Baltimore* is the third sub to be launched this year at Electric Boat. Last April, the shipyard christened a sister ship, the *Boston*, and the *Michigan*, the second Trident ballistic missile-firing submarine.

Baltimore will be the sixth ship to carry the name. Her predecessors were a brigantine that saw service in the Revolutionary War, a late 18th century ship, a Civil War sidewheel steamer, a World War I cruiser/minelayer and a World War II heavy cruiser.

ATC Telephones Offered at Discount To GD Employees

General Dynamics employees may now purchase American Telecommunications Corporation (ATC) decorator and character telephones and the Teledialer® automatic dialers at a special employee price.

ATC manufactures the popular Mickey Mouse Phone, the Snoopy & Woodstock Phone, the Winnie-the-Pooh Phone, several models of the CradlePhone™, the ChestPhone™, the Empress™ telephone and the Candlestick Phone®. All models of telephones are available with rotary or push-button dialing.

The Teledialer automatic dialer stores 16 of a telephone user's most frequently called numbers and then will dial them automatically.

Employees interested in learning more about the decorator and character telephones and the dialer should contact their Industrial Relations departments and obtain an ATC booklet which describes the telephone equipment, the special employee price and instructions on how to order the equipment.

According to Thomas P. Eisenstadt, ATC's Director of Sales, ATC will attempt to ship employee orders received through Industrial Relations within three weeks of receiving the order. Employees may purchase up to five telephones per year.

Savings And Stock Investment Values

	Sept. 1978	Sept. 1979	Sept. 1980
Salaried			
Government Bonds	\$ 2.0404	\$ 2.2214	\$ 2.4397
Diversified Portfolio	1.3531	1.5843	1.9671
Fixed Income	—	1.0235	1.1258
Hourly			
Government Bonds	2.0394	2.2216	2.4374
Diversified Portfolio	1.3836	1.6204	2.0068
GD Stock	\$32.9000*	\$44.7500	\$68.5000

* Reflects 2½ for 1 stock split

Convair Designs Composite Beams to Build Space Platforms

Problem: Build a platform in space for a radar antenna the size of a football field.

Problem: Design an emergency footbridge to replace bridges washed out during hurricanes or floods.

Problem: Create a radio antenna tower that can be used by soldiers in the field, deployed quickly and carried in small military vehicles.

A solution to these and other problems, both in space and on Earth, may lie in work being done in Advanced Space Programs at Convair Division. In a company-sponsored research and development program, Convair engineers have developed an expandable truss beam that opens to nine or more times the length of the original package.

According to Ed Hujsak, Advanced Systems Project Engineer, a single Space Shuttle flight could carry more than 12,000 feet of packaged trusses – a total of 24 500-foot-long beams. These could be expanded in low Earth orbit to construct a variety of space platforms, in almost any shape that can be built with straight lines: hexagons, octagons, rectangles, flat surfaces and complex constructions.

On Earth, a temporary footbridge 70 feet long could be carried in the back of a pickup truck and, depending on the materials used, weigh as little as 250 pounds. Longer bridges could be made by joining sections together.

A portable military radio or radar tower could be flown into a forward operating location and quickly erected and almost as quickly taken down and moved when the need was no longer at that location.

GDCC Announces Vice Presidents

General Dynamics Communications Corp. (GDCC) recently named three new vice presidents, according to William M. Lombardi, GDCC President.

Lewis Fincke was appointed Vice President and Controller, while Jerald B. Russ and Michael A. Sternberg joined as Vice President-Industrial Relations and Vice President-Marketing, respectively.

Fincke, formerly Financial Controller at Stromberg-Carlson in Tampa, joined General Dynamics in 1962 as a Senior Auditor in the New York office. In 1967, he transferred to Stromberg-Carlson in Rochester, N.Y., as Senior Financial Analyst, and he has held various managerial positions with the company. He is a 1962 graduate of Iona College, New Rochelle, N.Y.

Russ joined GDCC after serving with Liberty Loan Corp., in St. Louis as Vice President and Director of Human Resources. Prior to that he was Director of Personnel for Saga Corp., Menlo Park, Calif., and division Personnel Director for Federated Department Stores in Palo Alto, Calif. Russ earned a Bachelor of Science degree in 1948 from the University of Illinois in Urbana, Ill.

Sternberg came to GDCC from OKI Electronics of America, Ft. Lauderdale, Fla., where he was Vice President of Marketing and Sales. Prior to that, he was a principal in two telephone interconnect companies in Greenwich and East Hartford, Conn.

Sternberg is a 1964 graduate of Hofstra University, Hempstead, N.Y., with a bachelors degree in psychology. In 1965, he earned a Master of Business Administration and a Master of Arts in Industrial Psychology from New York University.

"There is nothing inherent in the design which restricts the size or scale of the structure," Hujsak says. "While the prototype at Convair is made from one-inch and two-inch carbon composite tubing, aluminum or steel tubing could also be used and the joint and hinge hardware sized accordingly. When packaged, the prototype truss beam occupies approximately one-ninth of its expanded length, and the expanded volume is 43 times the size of the original package," said Hujsak.

The demonstration prototype at Convair is based on a diamond shape seven and one-half feet from top to bottom, five feet across, and 26.5 feet long, which contracts into a package nine inches deep and 34 inches long.

This versatile structure could become the "two-by-four" of space construction, allowing engineers to design space platforms of many configurations, build and test them on Earth, and package them for automatic, remote deployment when carried into orbit by rocket boosters, Hujsak says.

Convair engineers have calculated that a single load of trusses carried into space by the Space Shuttle could construct the basic platform for a solar power array 1,000 feet long and 500 feet wide.

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Stromberg's ISB Gives Customers Answers, Action

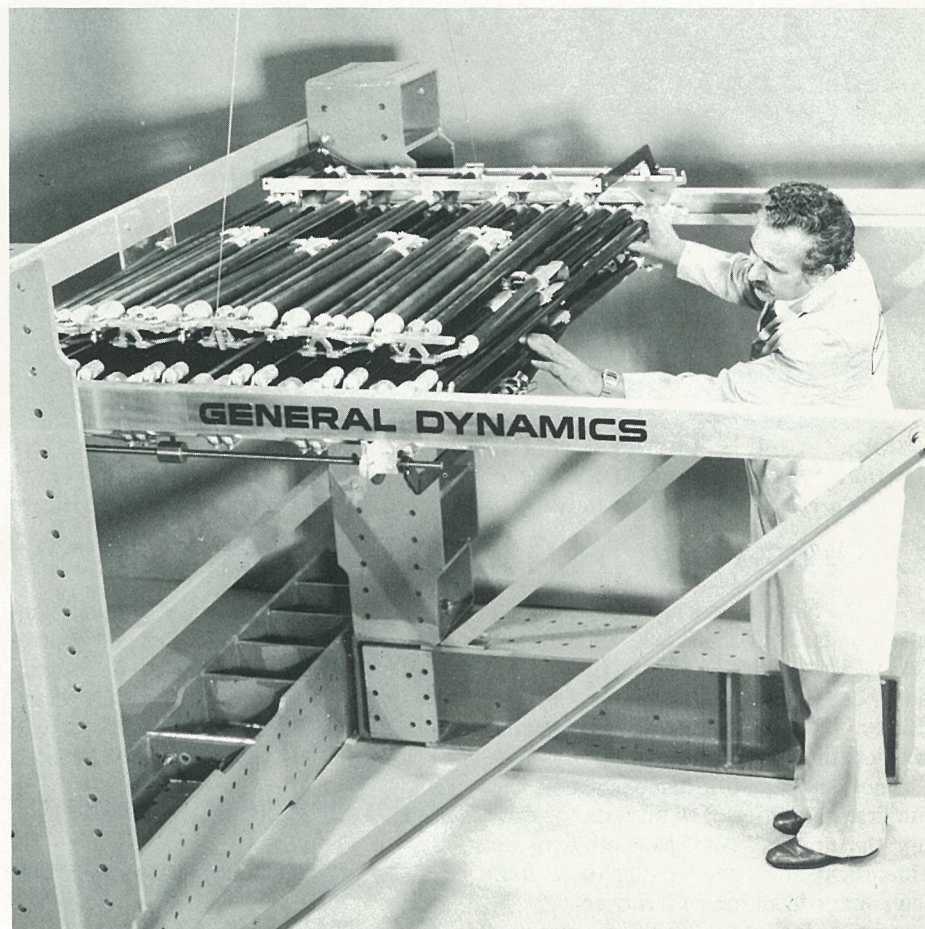
Stromberg-Carlson has set up a new Information Service Bureau (ISB) to provide answers and action to customers' inquiries.

Established a little over a month ago, the Information Service Bureau (ISB) is equipped with an "800" number (800-237-4209) which is listed in all Stromberg-Carlson advertising. The ISB is a referral service and a main source of information for Stromberg-Carlson's customers. It is staffed from 8:00 a.m. to 5:00 p.m., Monday through Friday. During evenings and on weekends, a recorded message is connected to the number, with the ability for the calling party to leave a message.

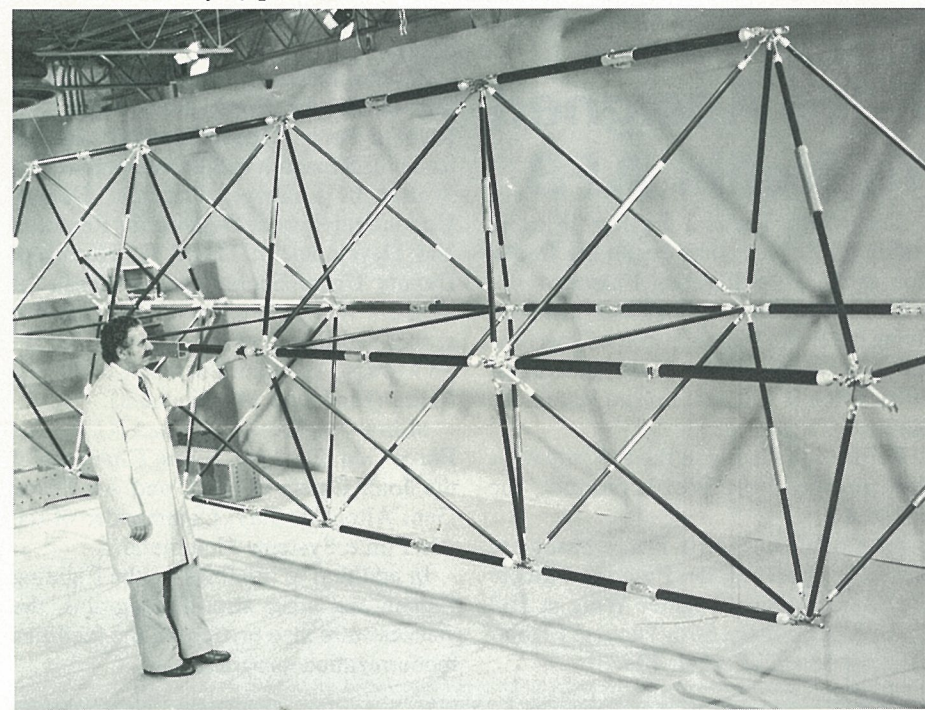
When a customer calls the ISB for information or assistance on S-C's products, Debbie Erb or Sandra Fernandez determine who should be notified for follow-up. If the caller requests literature, it is sent out the same day. If the customer wants to talk to a sales person, the necessary information is obtained, and the customer receives a call back quickly.

"Sometimes you have to pull the information out of the customer," Fernandez says. "It takes some deductive reasoning to figure out what they want and who can best serve them. Everyone in the company is very cooperative and helpful, though; it just takes some digging."

Erb and Fernandez also maintain a corporate library containing press clippings, trade magazines and industry publications, sales literature, product slides and competitive information.



Space Two-by-Four? Convair's expandable truss beam is nine inches high and just 34 inches long (top), yet it can expand to more than 26 feet long by seven-and-a-half feet high when deployed (bottom). The beam could be carried into space and used to construct a variety of platforms.



To EB's Gnatowski a Big Lift Is Really Not Such a Big Deal

Henry Gnatowski sits on top of Electric Boat's world every day as first-shift operator of the 300-ton portal crane, the yard's largest. (The 300-ton label refers to the crane's lifting capacity. Actually, it weighs 1,000 tons.)

Seated in his snug operator's cab 65 feet above the hustle and bustle of the Land Level Facility's south wing wall, Gnatowski seems far removed from the everyday cares of land-based shipbuilders.

"It's nice and quiet up here," he says, swiveling his chair around between an array of levers, dials and switches, "but we can't afford to make any mistakes."

He's right. The crane lifts 800-1,000 tons of highly valuable equipment and components each week – submarine hull sections and other components worth millions of dollars.

The "we" Gnatowski refers to are himself and his ground radio man, Rigger Ed Bergeron. "I won't move this thing without an okay from him," says Gnatowski, referring to the single most important safety regulation on the crane's operation. "The last thing I want to do is run over someone."

The crane also bristles with mechanical safety features. Gnatowski points out a travel limit circuit breaker that stops the crane automatically when it approaches a temporary bridge to the wet dock area.

It has "upper limit" switches that prevent the fall (lift line) from traveling through the block (roller) and parity

circuits that compare electronic signals in tandem systems and shut the crane down automatically if they malfunction.

Other safety functions include checking the cable once each month and having the crane totally inspected once each year.

Is the crane difficult to handle? "It's so easy and so smooth," says Gnatowski, "that we really don't have any tough lifts. Actually, the bigger a crane is, the easier it is to handle," he continues, "because they go slower." Warning bells clanging, the 300 tonner travels at 44 feet per minute, hardly a neck-snapping pace.

What makes her move is a 1,000 horsepower diesel engine about 20 yards behind Gnatowski in a separate cab. The engine charges the five generators that power the crane. Nearby, two huge spools wind the 5,900 feet of one-and-three-eighths inch cable for the crane's main fall and 6,000 feet for the boom fall.

An Air Force veteran, Gnatowski logged many hours in planes. But his time in cranes far surpasses any he ever spent in the wild blue yonder. He's been showing all types of cranes who's boss for 33 years. Starting in "steamers" – large steam operated rigs – at a Pennsylvania steel mill near where he grew up, he moved on to places like Buffalo and Chicago.

Gnatowski sums up his work modestly with confidence born of long experience and a quiet professionalism: "It's just like driving a car," he smiles. "The longer you drive, the better you get at it."

GD World

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Catapult Test. A Convair-built Tomahawk II Medium Range Air-to-Surface Missile (MRASM) is pushed across the deck of the aircraft carrier USS Kitty Hawk (left) in preparation for a test to verify an aircraft/MRASM combination's ability to

withstand catapult launches. Mounted under the wing of a U.S. Navy attack aircraft, the MRASM is ready for the test as the aircraft is positioned at the catapult (center) and then launched (right).

Convair's MRASM Proves Capability for Carrier Operations

A U.S. Navy attack aircraft carrying a Convair-built Tomahawk II Medium Range Air-to-Surface Missile (MRASM) has been catapulted from the aircraft carrier USS *Kitty Hawk* which was under way off the California coast.

The October 30th demonstration was the first in a series of flight tests to verify that the aircraft/MRASM combination is able to withstand the stresses of catapult launchings from aircraft carriers.

After launch, the MRASM—attached to a wing pylon of the A-6 Intruder—aligned its guidance system and navigated the aircraft on a simulated mission to the Naval Weapons Center, China Lake, Calif., using the Terrain Contour Matching (TERCOM) update process.

F-16s Assigned To Nellis AFB

The 474th Tactical Fighter Wing at Nellis AFB, Nev., has begun the transition to the F-16 Fighting Falcon.

The wing, organized in 1943, has been flying the F-4D Phantom and will become fully converted to the F-16 in August 1981 when it will receive the last of the planned 72 aircraft.

Before converting to the F-4, the wing flew another Fort Worth product, the F-111A.

Two other U.S. Air Force bases are currently operating the Fighting Falcon: the 388th Tactical Fighter Wing at Hill AFB, Utah, and the 56th Tactical Fighter Wing at MacDill AFB, Fla.

Previous demonstrations included handling tests aboard the carrier and captive flight tests to check the electronic connections between the missile and the aircraft.

Following the flight, the MRASM will be sent to the Naval Air Test Center,

Defense Leaders Receive Briefings At Fort Worth

Several key civilian and military defense leaders toured Fort Worth last month and were briefed on F-16 Fighting Falcon and other advanced aircraft programs.

Among the civilian visitors were Secretary of the Air Force Hans Mark; Dr. Richard Perry, Under Secretary of Defense for Research and Development; Dr. Walter B. LaBerge, Principal Deputy Under Secretary of Defense for Research and Development; David C. Hardison, Deputy Under Secretary of Defense for Tactical Warfare Programs (Defense Research and Engineering), and Charles W. Snodgrass, Assistant Secretary of the Air Force (Financial Management).

Military leaders included U.S. Air Force Gen. David C. Jones, Chairman of the Joint Chiefs of Staff, and Air Force Gen. Alton D. Slay, Commander of the Air Force Systems Command.

In addition to briefings on the Fighting Falcon and other aircraft programs, the visitors were also briefed on the facilities modernization program

Patuxent River, Md., for an extensive series of catapult and arresting tests on another Navy A-6.

Earlier this year, the Department of Defense announced that the MRASM will use the basic Tomahawk cruise missile design to meet the joint Navy/Air Force requirement for a medium range air-to-surface weapon system. The Tomahawk II MRASM will provide Navy and Air Force tactical air forces with a standoff capability to attack high-value, heavily defended targets with non-nuclear payloads. Present plans call for the MRASM to be carried by the Navy's

A-6E attack aircraft and the U.S. Air Force's F-16 and B-52D aircraft.

The Tomahawk cruise missile, from which MRASM is derived, has been under development by Convair since 1972. Convair recently received its first production contract for the Navy Tomahawk sea-launched cruise missile and is the prime contractor for the Tomahawk ground-launched cruise missile for the Air Force.

The Tomahawk II MRASM is being developed for the Navy and Air Force under the direction of the Department of Defense's Joint Cruise Missile Project.

Around the World... ...in GD

CHQ: William S. Gilliland joined as Corporate Director-Japan & Korea... David L. Deaton was named Internal Auditor.

Fort Worth: B. G. Arms was promoted to Logistics General Supervisor... J. C. Barber, W. A. Lambert Jr., C. B. Perry, and M. A. Ransom were named Logistics Supervisor... H. B. Blount 3d was promoted to Chief of Estimating... R. A. Capshaw was named Project Specialist... D. Chadwick, R. S. Irving, K. H. Rumbaugh and D. R. Weber were promoted to Manufacturing Control Supervisor... G. D. Cox, C. P. Denton and T. W. Mars were named Material Stores Supervisor... G. A. Davis was promoted to Program Specialist... P. O. Gallagher and W. A. Haines were promoted to Purchasing Agent... M. L. Harris and L. P. Tellier were named Field Service Engineer... R. J. Hill was promoted to Manufacturing Control General Supervisor... J. L. Hodgkins 3d was promoted to Program Analyst Senior... J. E. Holder and P. L. Nicholson were promoted to Inspection Supervisor... A. K. Johnson was promoted to Project Coordinator... J. F. Jeffress was named Financial Analyst Senior... R. D. Macgregor was promoted to Program Analyst Senior... K. R. McCollum was promoted to Manufacturing Technical Engineer Senior... B. L. McMillen was promoted to Chief of Manufacturing Control... L. H. Rives was named Logistics Contract Analyst... J. B. Schlecte was promoted to Transportation Foreman... R. N. Steres was promoted to General Foreman.

Electric Boat: J. Collins was promoted to Chief of Engineering... J. Hardink was promoted to Chief of Employee Benefits... J. Lorraine and J. Michaels were promoted to Engineer... R. Palmieri and P. Prior were promoted to Engineering Supervisor... A. Smith was promoted to Group Trade Planner... N. Chandonnait was promoted to General Foreman... C. Dickens was promoted to Program Chief... R. Gudis was promoted to Training Administrator.

Convair: G. A. Bender was promoted to Operations Supervisor-Manufacturing... D. T. Kuczon was promoted to Engineering Chief... J. C. Lisk and R. D. David were promoted to Manufacturing Development Engineer... W. W. Glenzer was promoted to Logistic Administrator... J. A. Kelly Jr. was named Tool & Manufacturing Engineer-Senior... J. W. Porter was promoted to Project Engineer... R. C. Helton was promoted to Research Engineer Senior... R. H. Storer was promoted to Research Engineer... H. Lockwood and M. A. Wilkerson were promoted to Specification Analyst... J. H. Nakai was promoted to Weight Engineer Senior... B. W. Cornett, J. J. Motycka and R. Perisho Jr. were promoted to Electronics Engineer... G. Klein-Wassink was promoted to Buyer... B. L. Pumphrey was promoted to Program Control Analyst Senior... H. D. Thomas was promoted to Flight Test Engineer.

Quincy: J. Muir was named Chief of Purchasing Administration... W. Clapper was named Senior Manufacturing Engineer.

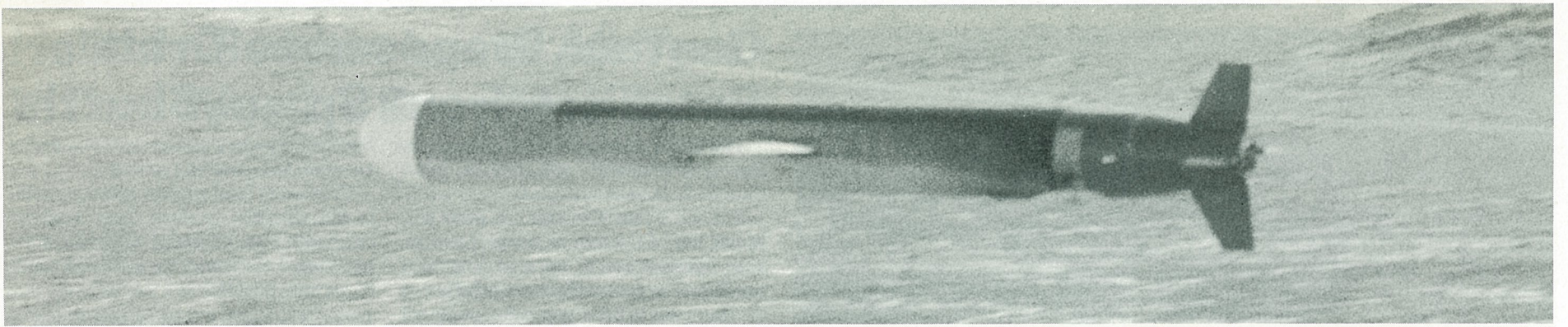
DSS: D. Snay was named Senior Production Control Analyst... R. D. Williams was named Supervisor of Data Processing.

Stromberg-Carlson: O. E. Fox was promoted to Engineer-Sales Support I... R. E. Huffman was promoted to Senior Engineer-Sales Support... W. W. Woodruff was promoted to Supervising Engineer-Group I.

Pomona: J. A. Forster was promoted to Chief-Inspection... N. E. Koon was promoted to Manufacturing Supervisor... A. J. Schmitt Jr. was promoted to Quality Assurance Specialist Senior... J. L. Gilkerson and S. Turbitt were promoted to Systems Analyst... R. L. Herin and V. J. Costello were promoted to Manufacturing Engineer... J. R. Atkins Jr. and A. J. Puntous were promoted to Chief-Plant Engineering... N. C. King was named Quality Assurance Specialist... J. J. Sennikoff was named Production Line Manager.



Beautiful Job. A Convair-built Atlas/Centaur lifts off from Cape Canaveral's Complex 36 last month sending a Fleet Satellite Communications spacecraft into orbit (See Story Page 2).



Land-Attack Test. A U.S. Navy/General Dynamics Tomahawk cruise missile flies a simulated land-attack mission over the western United States after being

launched at Point Mugu, Calif., from a prototype vertical launching system (See Story Page 2).

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F-16XL Planning. Randy Kent (right), Fort Worth's F-16XL Program Director, discusses the new aircraft with (from the left) Clarence Hart, Chief Engineer; Harry Hillaker, Deputy Program Manager, and George Hayward, Manager of Air Frame Design.

Kent, Hillaker, Hart to Head F-16XL Development Team

Fort Worth's D. Randall Kent, Harry J. Hillaker and Clarence E. Hart have been named to head the team developing the F-16XL, an advanced version of the F-16 incorporating new aerodynamic and systems technologies.

The F-16XL will feature a new highly swept, arrow-shaped wing, developed by Fort Worth after years of extensive work and collaboration with NASA, combined with the proven F-16 fuselage structure and avionics systems and the reliable Pratt & Whitney F100 turbofan engine.

As Vice President and Program Director for the company-funded development effort, Kent, 54, will lead the team of more than 100 specialists assigned to the project.

Kent was formerly Vice President F-16 Engineering. He joined the company in 1949 as a propulsion engineer and has held various assignments on the B-36, B-58, F-111 and F-16 programs. He holds a bachelor's degree in mechanical engineering from Louisiana State University, a master's degree from Cornell University and has completed course work toward a doctorate at Tulane University.

Vice President Harry Hillaker, 61, will serve as F-16XL Deputy Program Director. He formerly was Chief Project Engineer F-16 Advanced Versions. Hillaker joined General Dynamics at San Diego in 1941, after receiving his bachelor of aeronautical engineering degree from the University of Michigan. He has been involved in the advanced design of every major aircraft produced at Fort Worth since 1942 and has been associated with the F-16 Program since it began in the late 1960s, serving as YF-16 Deputy Chief Engineer and Director of F-16 Marketing. He also was the leader of the advanced design effort on the F-16XL.

Hart, 57, has been named Chief Engineer for the F-16XL Program. He had

been serving as Chief Engineer for the F-16/79 Intermediate Export Fighter Program. He has held a number of increasingly important assignments in Fort Worth's engineering and production organizations since he joined the company

Continued on Page 4

Bremerton Lauded For Successful First Sea Trials

Electric Boat's Sixth 688-Class fast-attack submarine, *Bremerton* (SSN698), received high marks on her first sea trials conducted earlier this month.

A high ranking U.S. Navy official said, the trials, which included performance of the ship's equipment and propulsion plant, represented, "one of the best submarine sea trials observed in recent times."

"*Bremerton* is one of the best boats ever built at Electric Boat," said L. E. Holt, EB's Assistant General Manager-Operations, who headed a team of 37 shipyard employees on board for the trials.

During her two days at sea, the 360-foot, 6,900-ton vessel made test dives several hundred miles out in the Atlantic.

Bremerton is a member of the U.S. Navy's newest class of attack submarines, the most advanced underseas vessels of their type in the world. Their mission is to hunt down and destroy enemy surface ships and submarines.

The ships are equipped with highly accurate sensors, weapon control systems and central computer complexes. Their armament includes sophisticated Mark 48 antisubmarine torpedoes, Harpoon and other weapon systems. Each sub is manned by a crew of 12 officers and 115 enlisted men.

Electric Boat has already delivered five of the ships and has contracts for 15 more.

Pomona Delivers Submissiles For Assault Breaker Program

Pomona Division has delivered the first Terminally Guided Submissiles (TGSMs) to the U.S. Army for use in a flight demonstration test to prove the feasibility of the Assault Breaker Program.

The Assault Breaker Program is a new antiarmor warfare concept which uses precision guided submissiles to attack enemy armor. In this concept, terminally guided submissiles are carried in a larger missile, which is launched and guided to a general target area where the submissiles are dispensed from the larger missile and then guide themselves to a target.

During the system flight demonstration, which is sponsored jointly by the Advanced Research Projects Agency and the U.S. Army, Pomona's submissiles will be launched from carrier missiles built by Vought Co. and Martin Marietta, Inc.

In February 1979, Pomona won a \$20.9 million contract following a competition with Boeing. This contract calls for production of 90 live and 42 dummy rounds over a 22-month period. Three submissiles will be delivered to the Army by the end of this year.

Under terms of the contract, Pomona will demonstrate that Terminally Guided Submissiles can be dispensed from a supersonic and subsonic carrier missile to seek a target and guide themselves to impact.

"Assault Breaker is an experiment to prove the feasibility of stopping enemy armor behind the battle lines before it

becomes a threat," says Lee Hanon, TGSM Program Manager. "During free-fall flight tests last year, a submissile produced by Pomona was dropped from a helicopter and scored a direct hit on a tank. Now it is time to show how the whole system works together."

The TGSM is a unique concept because the submissiles are delivered to the general target area and then must autonomously seek out and home on a target. The submissiles have no means of self-propulsion, but are propelled to the target by the force of gravity.

Many key elements integrated into the design of Pomona's submissiles have roots in Independent Research and Development (IRAD) work initiated by Pomona engineers.

Work done on the infrared seeker and general optics design used in TGSM began in the early 1970s. Steve Domen, a Pomona Electrical Engineer, gradually developed a seeker designed for air-to-ground missiles and has continually refined the homing device.

Also, several structural and aerodynamics engineers collaborated on an IRAD project to design an airframe which gives the TGSM high maneuverability. The key design element making this possible is a collapsible wing which unfolds after launch and which permits the submissile to maneuver for long distances as it locks on a target.

Santa Lends ATC a Hand In Testing Consumer Market

With a little help from Santa, American Telecommunications Corporation (ATC) is conducting market research in Florida during the holiday season.

A booth displaying ATC's complete line of decorator and character phones has opened in a shopping mall in St. Petersburg to study consumer response.

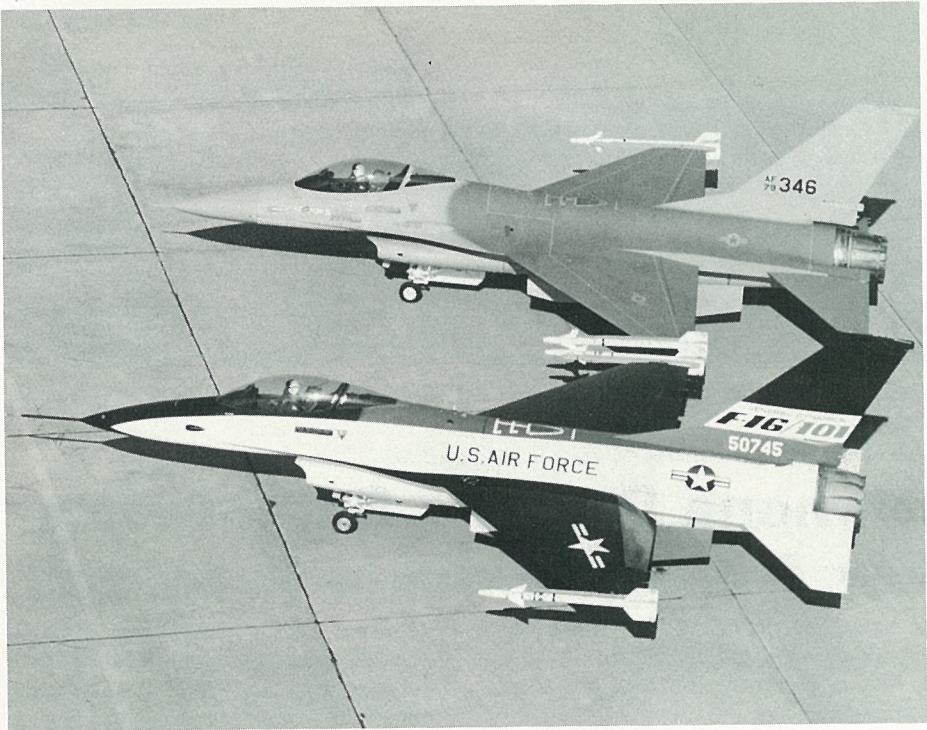
The test will cover three different areas: customer reaction to a temporary sales channel—the booth—versus the permanent PhoneCenter Stores that telephone companies use; consumer awareness and acceptance to buying and owning a deco-

rator telephone, and shopper reaction to the complete line of ATC decorator telephones.

According to John Tymoczko Jr., ATC Vice President of Marketing, "The St. Petersburg location was selected because it provides an excellent consumer base not presently being exposed to decorator telephones. We saw an opportunity to bring decorator telephones to the St. Petersburg/Tampa area during the traditional gift purchasing season and at the same time gather valuable research."



Santa Speaking. Santa Claus takes a telephone call from an American Telecommunications Corporation booth set up at a shopping mall in St. Petersburg, Fla., to study consumer demand for decorator and character telephones.



Ready for Test. The F-16/101 (foreground), equipped with a General Electric F101 Derivative Fighter Engine, next to a production F-16 on the Fort Worth flight ramp.

F-16/101 Will Flight Test Derivative Fighter Engine

The first of the F-16 full-scale development aircraft will soon take on a new task as the F-16/101. The fighter, one of eight built for the F-16 developmental flight test program, will be the first aircraft to flight test General Electric's new F101 Derivative Fighter Engine (DFE) during a five-month program at Edwards AFB, Calif.

General Electric is developing the 26,000-28,000 pound thrust class F101DFE turbofan engine as a potential alternative engine for advanced fighters under a contract sponsored by the U.S. Air Force and the U.S. Navy. Following a flight evaluation in the F-16/101, the engine will also be flown in a Navy F-14 fighter.

Minor structural changes to the aircraft, engine installation and engine ground tests were completed last month at Fort Worth. High speed taxi tests and the aircraft's first flight are scheduled for mid-December at the Air Force Flight Test Center at Edwards.

The F-16/101 was transported to California in early December in an Air Force C-5 Galaxy.

Test flights will be conducted by General Dynamics Test Pilot David R. Palmer and Air Force Capt. Greg Lewis of the Flight Test Center.

"Our task is to determine how well the F101 engine works in the F-16," said Fort Worth F-16/101 Program Manager James R. Vaughn. "The contract calls for approximately 100 hours of flying to determine such things as engine control and response, emergency controls, air start capability, acceleration, afterburner operation and performance during simulated combat missions."

Vaughn's staff totals about 24. However, more than 200 Fort Worth employees have contributed to the F-16/101 Program.

After test flying is finished in May, Vaughn and his staff will analyze test data and submit a final report to the F-16 Air Force System Program Office.

The red, white and blue test aircraft

was first unveiled at Fort Worth on Oct. 20, 1976, in ceremonies attended by then U.S. Secretary of Defense Donald Rumsfeld and representatives from the defense ministries and air forces of five nations. The aircraft first flew on Dec. 8, 1976, and made 461 flights totalling 531 flight hours with the standard Pratt & Whitney F100 turbofan engine before being assigned to the F101 Program.

General Marsh To Head AFSC

U.S. Air Force Lt. Gen. Robert T. Marsh has been nominated to become Commander of the Air Force Systems Command (AFSC), replacing Air Force Gen. Alton D. Slay, who is scheduled to retire on February 1st.

Gen. Marsh has commanded the Electronics Systems Division of AFSC since May 1977. He began his military career in 1943, when he was inducted into the Army Air Force and received training as an aircraft mechanic and aerial gunner for B-24 and B-17 bombers. He received an appointment to the U.S. Military Academy in 1945 and was graduated in 1949 as a second lieutenant.

Fixed Income Fund Guaranteed Yield To Be Increased

The guaranteed minimum yield for General Dynamics Savings and Stock Investment Plan's Fixed Income Fund for salaried employees will be increased to 10.75 percent for 1981. This is the fourth successive increase in the guaranteed minimum yield since the fund began in July 1979.

The effective annual rate of return was increased from 9.5 percent to 9.75 percent for the last half of 1979, to 9.85 percent for the first half of 1980 and 10.35 for the last half of 1980.

In addition, in the future, the fund's assets will be invested by the Travelers Insurance Co. as well as the Aetna Life Insurance Co.

Centaur Proposed to Orbit Satellites from Space Shuttle

The Centaur upper-stage booster is the leading contender for use with the Space Shuttle to launch satellites.

For some time Convair has been proposing use of Centaur as a high-performance upper stage, to be used in putting satellites into geosynchronous orbit above the Earth and to boost scientific spacecraft into deep space. Several different NASA study contracts have kept the Centaur option alive, while Convair engineers and designers worked on methods to allay any technical objections or concerns.

At first, objections centered around carrying the large amounts of cryogenic liquid fuels used by Centaur in a manned spacecraft. Solid fuels were preferred for the upper stage for this reason. However, venting and propellant control systems were designed by Convair to increase safety of the liquid propellant systems with minimum changes to Centaur and the basic Shuttle design.

In addition to the venting and propellant control systems, a Centaur Integrated Support System and other required structures for deployment and support were designed to hold the Centaur within the

Shuttle cargo bay and to contain special avionics and control systems.

Because of total space limitations within the Shuttle payload bay, Convair engineers also proposed alternate sizes and shapes of vehicles to satisfy the needs of various payloads.

The standard Centaur allows for a payload length of 26 feet and can put 12,200 pounds of satellite into geosynchronous orbit. However, since the Centaur is only 10 feet in diameter, there would be unused space in the cargo compartment of the Shuttle surrounding the vehicle.

A wide-body Centaur, with large diameter fuel tanks, would be approximately 10 feet shorter than the standard vehicle, allowing a 36-foot-long payload. The load-carrying capacity of this vehicle would carry a 14,000-pound satellite.

A short wide-body Centaur would allow spacecraft up to 42 feet in length and weighing 9,000 pounds to be placed in geosynchronous orbit. This weight is nearly twice that presently allowable for such satellites.

Tomahawk Missile Is Tested From Vertical Launch System

A U.S. Navy/General Dynamics Tomahawk cruise missile was successfully launched from a prototype vertical launching system at the Navy Pacific Missile Test Center, Point Mugu, Calif., on November 26th. The launcher is under development for use with the Standard Missile, ASROC and Tomahawk systems in surface ships of the U.S. Navy.

Following the launch, the Tomahawk transitioned into cruise flight over the Pacific Ocean and then flew a simulated land-attack mission over an inland route to the Utah Test and Training Range at Dugway, Utah.

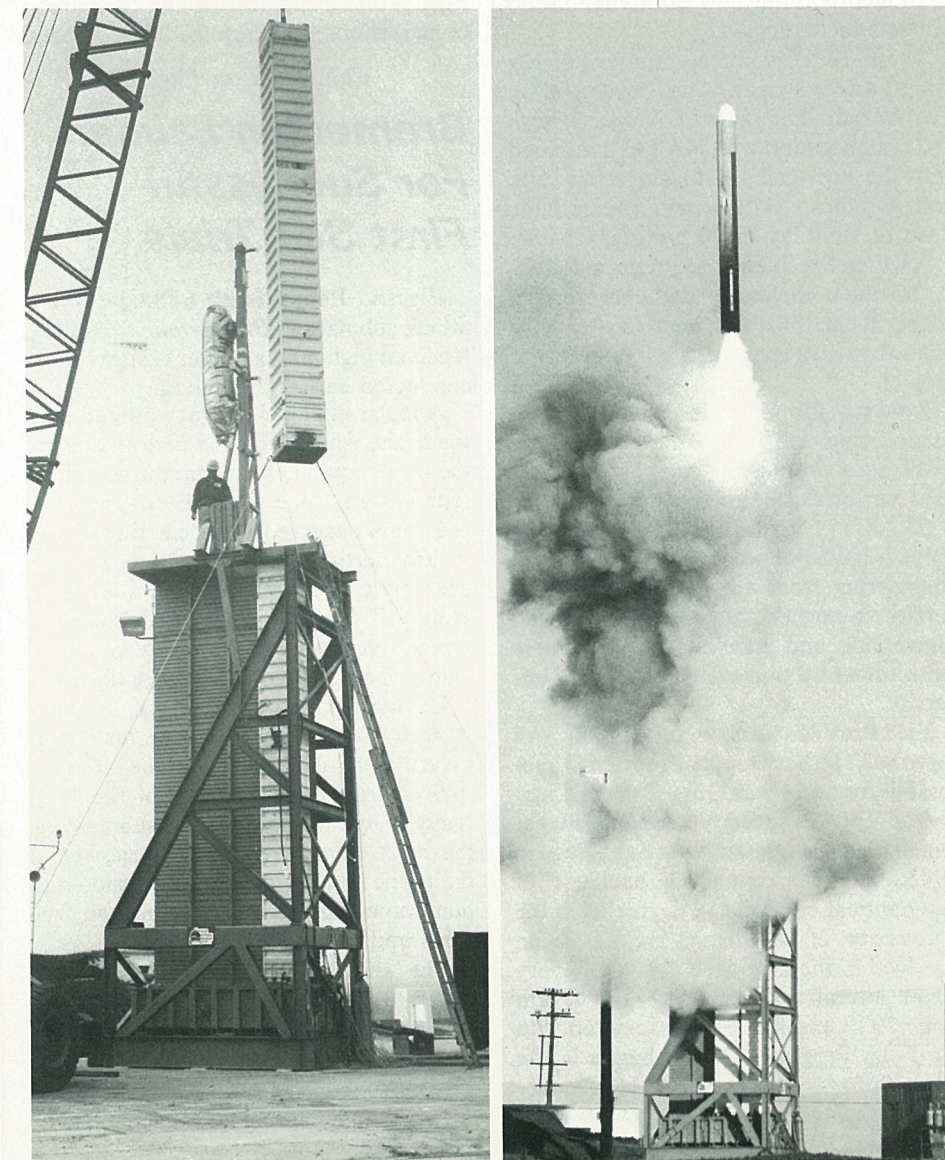
The Tomahawk-capable vertical launcher is being developed by Martin Marietta for use in DD-963 Spruance-class destroyers and CG-47 Aegis-class cruisers. The combination of the Tomahawk cruise missile and the vertical launcher will significantly increase the offensive firepower of these ships.

The Tomahawk cruise missile can be launched from a variety of platforms, including submarines and surface ships of the Navy and truck-mounted launchers of the U.S. Air Force. It is propelled from these launchers by a solid-fuel rocket motor, and then transitions to cruise flight powered by a turbofan engine.

The land-attack Tomahawk is guided to its target by a highly advanced Terrain Contour Matching (TERCOM) guidance system, which compares computer-stored terrain data with terrain altitude characteristics obtained from a radar altimeter along preselected segments of the route to confirm and adjust the missile's flight path.

The launch was the 55th in a series of test flights which began in 1976.

The vertical launching system is being developed by the Naval Sea Systems Command.



Vertical Launch. A Tomahawk cruise missile, encased in a prototype vertical launcher, is positioned for a test at Point Mugu, Calif., (left) and is boosted out of the launcher prior to a simulated land-attack mission.

<i>Savings And Stock Investment Values</i>			
Salaried	Oct. 1978	Oct. 1979	Oct. 1980
Government Bonds	\$2.0484	\$2.2271	\$2.4364
Diversified Portfolio	1.2348	1.4977	2.0053
Fixed Income	--	1.0315	1.1336
Hourly			
Government Bonds	2.0476	2.2272	2.4342
Diversified Portfolio	1.2626	1.5324	2.0454
GD Stock	\$26.0000*	\$45.3800	\$65.8750
 *Reflects 2½ for 1 stock split of February 1979			

Holiday Season Lasts All Year In Fort Worth's Busy Mail Room

Dorothy Plumlee regularly delivers letters and parcels as she makes her regular mile-long mail run at the Fort Worth division. One time she delivered a lizard.

The letters and parcels are routine, part of the 39 tons of mail and parcel post that pass through the Fort Worth mail room each month, making it a busier place than some cities' branch post offices during the Christmas season.

The lizard, a live one, was highly unusual.

"I had just dropped off some mail, and before I left the envelope on top was opened," Plumlee recently recalled.

"There were two of us who were plenty surprised when that little lizard crawled out onto the top of the desk but come to think of it, that lizard was probably just as surprised as we were. No telling how it got into the envelope."

Most of the time, though, the unexpected doesn't pop out as Plumlee and her colleagues run their routes through the large plant and the outlying buildings that partly encircle it.

"They do a thankless and difficult job very well," says James Gregory, Communications Services Supervisor who heads the mail services section. "Once

they get the mail, it goes through."

On an average day, Gregory says, one of the mail transport clerks will pick up four hampers, each holding 10 bushels of mail and parcels, at the main Fort Worth Post Office at 5 a.m. Two other trips later in the day will bring three more hampers of parcel post and one of first class mail.

Four hampers full of mail and parcel post are taken to the post office three times each day, five days a week.

About a third of a month's mail — roughly 420,000 pieces — is generated in-plant and is carried from one of Fort Worth's 565 mail zones to another.

In addition to mail that is handled by the U.S. Postal Service, about 1,400 pounds of letters and documents are ferried to Europe on the Convair 880 which flies on a regular schedule between Fort Worth and Brussels, Belgium.

The first deliveries to the in-plant mail zones begin before 8 a.m. and the last mail out of the plant is taken to the post office about 4:45 p.m. every afternoon.

"I'm proud of the job the mail services section personnel do," Gregory says. "In spite of the volume of mail they handle, we get very few complaints about slow deliveries."

Stromberg-Carlson Builds Warehouse at Lake Mary

Stromberg-Carlson's newest addition, a 50,000-square-foot warehouse expansion to the company's Public Switching Center (PSC) in Lake Mary, Fla., is ready for occupancy. Equipment and supplies are being moved into the warehouse, which will be used for material storage and centralized material handling.

"This expansion is the first phase of the consolidation of six off-site leased facilities

ties into the PSC," says Dick Winslow, Director of Facilities. "Preliminary planning is currently under way for a new engineering and administration building on the Lake Mary property, scheduled for occupancy in 1983."

All material functions including receiving, shipping and repair and return for Stromberg-Carlson's central Florida facilities will be consolidated into this new facility which will satisfy production space requirements through 1982.

Through the use of high-density storage techniques, which allow storage heights of up to 21 feet, the new facility will have capacity equivalent to approximately 80,000 square feet, Winslow says. A wire-guided stacker will be employed which can operate efficiently in the six foot aisles of the new warehouse (normal width is 12-13 feet). This stacker uses a magnetic sensor to follow a wire buried beneath the concrete floor. An operator only has to power the stacker to its destination, with no steering involved. When the stacker arrives at a location, the mast of the stacker turns 90 degrees and reaches shelves, eliminating the need for wider aisles.

GD Divisions Win Suggestion Awards

Two General Dynamics divisions have been cited by the National Association of Suggestion Systems for the excellence of their programs.

Fort Worth won the Performance Excellence award for the best performance among all aerospace equipment manufacturers in 1979 based on the participation and quality of suggestions.

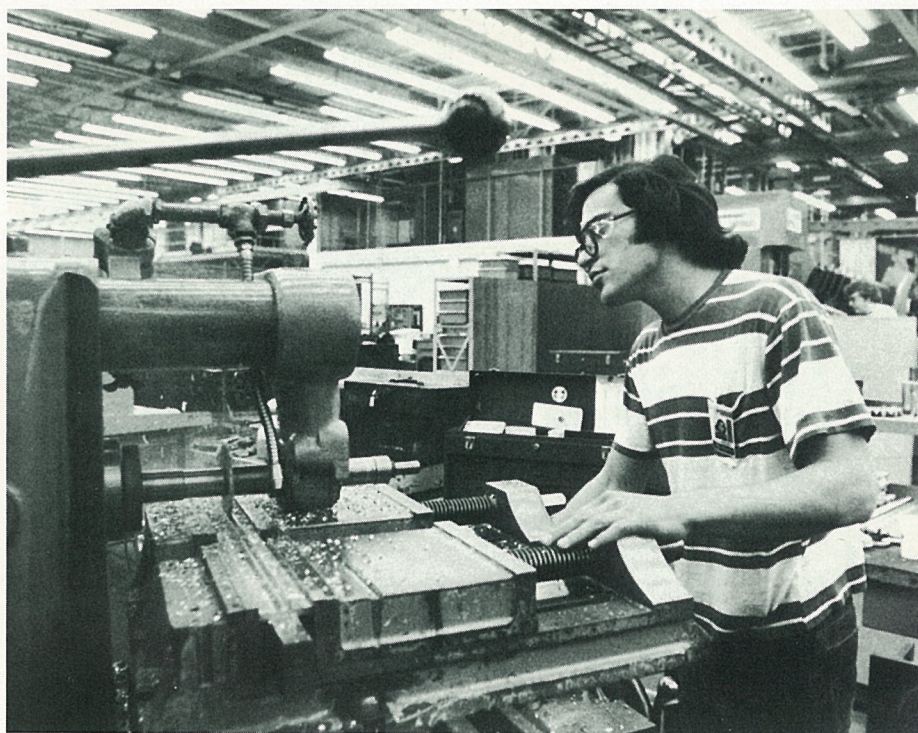
Pomona was cited for the highest average suggestion savings per employee among the nation's aerospace firms.

Donation Record Set In Blood Drives

Fort Worth employees rolled up their sleeves and donated 2,548 units of blood between January and October — a record for the program which is sponsored by the Employee Services Department.

The donor program, run in cooperation with the non-profit Carter Blood Bank, assures that division employees and their immediate families will be able to receive blood if it is needed because of accident or illness.

Four drives were held at the plant: in January, 556 employees donated blood; in April, 550 gave; in July, 655 donated, and in October, 787 gave.



New Machinist. Al Marquez, mill machinist A, is one of 15 Pomona Division employees who were promoted from machinist trainee to machinist after completing an extensive training course.

15 Pomona Employees Finish Machinist Training Program

The first 15 employees to complete Pomona Division's Machinists Training Program were recognized at a recent ceremony and have been advanced from machinist trainee to machinist A.

These new machinists are the first in a program designed to help Pomona overcome the critical shortage of qualified machinists.

Through the Machinists Training Program, trainees learn blueprint reading, mathematics, skills for machine setup and tooling techniques. The training course consists of classroom instruction and supervised on-the-job training. Machinist trainees attend classes two hours each day at Pomona's personnel development and training classrooms. Following class,

trainees sharpen their skills while machining parts for Pomona's development programs in the Experimental Machine Shop.

Participants focus their training on either lathes or milling machines. Also, special instruction in numerically controlled machining is available.

"I compliment you people for taking advantage of this opportunity to improve your skills and advance yourselves professionally," said Gus Goldshine, Director of Preproduction Prototype Operations, during the ceremony. "As you probably know, you are badly needed here; we can barely get enough good machinists in our shops to meet our increasing workload."

"I took the course to help learn more about mills and to help in my own advancement," said Al Marquez, who was promoted to mill machinist A after starting at Pomona two years ago as a mill machinist trainee. "This has been a great boost to me. You can never learn all you need to know."

Ron Bauer, another graduate of the program, started as a machinist trainee in May of 1979 when he was hired at Pomona. Now, as a Micro/Mini Precision Machinist, Bauer makes four to six setups each day while turning detailed parts on a small precision lathe in the Experimental Machine Shop.

Other machinists who were graduated from the program are Mark Barber, Ed Fagg, Chaz Gaudette, Robert Goodlowe, William Jones, David Kubes, Edward Marshall, Rene Nielson, John Orgorzelec, Richard Peacock, Alan Pope, Perry Posey and Paul Tapaya.

Lockard Named Pomona Director

Jerry K. Lockard has been appointed Director of Design Engineering at Pomona.

In his new position, he will be responsible for Weapon Control and Microelectronics Design, Missile Electronics Design, Electro-Mechanical and Electro-Optical Design, Design Support Services and Computer Aided Design and Manufacturing Technology. He will report to R. G. Low, Pomona Vice President-Research and Engineering.

Lockard joined General Dynamics at Pomona in 1962 as a junior engineer. He was promoted to Senior Electronics Engineer in 1967 and received his first management assignment, Group Engineer, in 1972. He became a Section Head in 1975 and was promoted to Manager of Design Engineering in 1977. During this time he has been responsible for the Microwave, Radar Frequency (RF) Guidance, and Standard Missile-1 and Standard Missile-2 Guidance Design sections.

Krueger Appointed FW Vice President Of Logistics Support

Rolf Krueger has been named Vice President-Logistics and Support at Fort Worth. He succeeds R. W. McGuffee who recently was named Vice President-Production.

Krueger, 43, had been serving as Director of Logistics. In his new position, he will be responsible for worldwide logistics and support of the F-16 Fighting Falcon, the multimission fighter currently flown by six air forces.

Krueger, who joined the company in 1971, has held a number of increasingly important engineering, planning and management positions at Convair and Fort Worth Divisions.

Krueger was graduated from Case Institute of Technology in Cleveland, Ohio, in 1959 with a Bachelor of Science degree in Mechanical Engineering, and in 1961 earned a Master of Science degree in Mechanical Engineering from Stanford University, Stanford, Calif.



Krueger

Quincy Receives Barge Contract

Quincy Shipbuilding Division has received a contract, valued at approximately \$15 million, from Coastwise Trading Company, Inc. of Delaware for the construction of a 471-foot chemical carrier barge.

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Tomahawk Brain. Jack Fassel shows how a Digital Integrating Subsystem (DIS) computer fits into a body section of a Convair Tomahawk cruise missile. A missile fully equipped with DIS would have one of these computers in each body section, controlling a portion of the missile's operation.

New Digital Flight Computers Will Be Tested On Cruise Missile

General Dynamics engineers working at Convair have delivered the first of a group of small airborne flight control computers which may have wide application to present and future aircraft and missiles.

The computers, called Digital Integrating Subsystems (DISs), are built from relatively inexpensive, off-the-shelf components, but are three to five times smaller than the flight control computers presently being used and require less power to operate, according to Dave Geyer, the project's Program Manager.

Convair is working on DIS under a contract from the Armament Division of the Air Force Systems Command. The contract calls for General Dynamics to deliver 25 computers, three test stations and a complete support software set. Convair has been aided in the contract by Pomona and Western Data Systems Center.

The DIS computers will be flown next year in the Midcourse Guidance Demonstration program, also under the direction of the Armament Division, and are being considered for use in future defense programs such as the Medium Range Air-to-Surface Missile and other Convair

products.

Geyer says that Convair's DIS approach to using computers for flight control calls for a series of small, federated computer subsystems, each one responsible for a particular flight function. For example, a computer subsystem in the rear section of a cruise missile could be responsible only for movement of the tail fins and increasing or retarding engine speed. Another computer subsystem in the front of the missile could be tasked with managing the forward-looking sensor.

All of the computer subsystems would be connected by a single two-wire serial bus, called the DISMUX, along which the signals are transmitted to all of the other subsystems. Each small computer listens to what the others are saying and would react in its own sphere of action to information provided by the others.

For example, the computer in the front end might receive information from the sensor that the missile is flying too low and relay this data along the DISMUX bus to the other computers. The computer subsystem responsible for the warhead would merely note the information, but the one in the rear section controlling the fins and throttle would react.

F-16XL Team Selected at FW

Continued from Page 1

in 1947. He served as Project Engineer for the FB-111A and Team Leader for integration of advanced technologies and computer-aided-design and manufacturing techniques on the F-16 assembly line. Hart holds a bachelor of aeronautical engineering degree from Texas A & M University and a master's degree in engineering administration from Southern Methodist University.

Two Demonstration Aircraft

The F-16XL team recently moved to the Hangar Building at the Fort Worth plant and work is currently under way on engineering drawings, design analyses and manufacturing planning that will lead to the building of two flight demonstration aircraft.

The U.S. Air Force is supporting the project by supplying the two F-16 full-scale development aircraft which will be modified to the F-16XL configuration, the F100 engines, a new two-place cockpit and flight test support at Edwards AFB, Calif.

"The F-16XL design capitalizes on what we have learned from seven years of F-16 operations and takes advantage of important new aerodynamic and systems technological advances made since the F-16 was designed in the early 1970s," said Kent. "As a result, we believe with the F-16XL we can provide substantially improved operational capability, both in the air-to-air and the air-to-surface roles."

"Fundamentally, with the F-16XL we

are increasing range and payload capability by reducing drag when carrying external stores," Hillaker said. "With the new wing and the 56-inch stretch of the fuselage, we are able to increase internal fuel capacity by 82 percent and gain an additional 40 cubic feet of space for avionics and sensor growth."

Modification to Begin In March

The F-16's modular construction and fly-by-wire flight control system will simplify the F-16XL modification process. The first of the full-scale development aircraft is scheduled to be received at Fort Worth in March, and structural modification will begin immediately. The second aircraft is scheduled to be received during the summer.

The new arrow-shaped wing will have an area of 646 square feet, more than double that of the standard F-16. Graphite plyimide composite wing skins will provide the strength and stiffness necessary for maximum wing performance.

One of the demonstration aircraft will be a single seater, the other a two-seat version.

According to Kent, computer and wind tunnel analyses show that the F-16XL clearly will extend the F-16's already remarkable capabilities. The analyses indicate that the aircraft will take off and land in only two-thirds of the distance required by the F-16, will have double the payload capacity for air-to-surface missions and will have 45 percent greater combat radius in both air-to-air and air-to-surface missions.

Around the World... ...in GD

CHQ: Kathleen L. Byler transferred from DSS and was promoted to Corporate Employee Communications Administrator... Kenneth A. Hill transferred from Western Data Systems Center and was promoted to Corporate Manager-Manpower Planning & Personnel Systems (EDP)... John M. O'Leary to Corporate Manager, Financial Planning Marine... Patricia M. Pauli joined as Corporate Manager, Financial Planning Aerospace.

Electric Boat: Paul Aas, Craig Coppage and Frank Schaaf were promoted to Assistant Chief, Nuclear Test Engineering... Kendall Adams to Senior Engineer... Kevin Coe and Michael Gentry to Chief Nuclear Test Engineer... Millard McGinty to Senior Ship Superintendent... Don Meyers to Engineering Supervisor... Gregory Stoltz to Chief of Engineering... David Wells to Contract Administrator... James Apicelli to Configuration Management Supervisor... Gregory Apraham, Joseph Bergin, Benjamin Bolt, Gilbert Brown, Richard Cady, Johnny Dieters, Andrew Ferguson, David Hayslip, Vicki Holman, David Huband, David Marvin, Gary Schneider, Stanley Schottroff, Barry Steamer, Paul Young and Frank Madden to Foreman... Frederick Bridge to Supervisor Trade Planning... Thomas Nelson to Chief of Financial Analysis... Henry Olexy to Group Trade Planner... Donald Weseman to Supervisor of Accounting... John Greenhalgh to Chief Test Engineer... John Stringer to Supervisor of NDT Engineering... Richard Wood to Quality Assurance Supervisor.

Fort Worth: H. R. Horn was promoted to General Foreman... B. A. Hurdle to Planning Coordinator... J. P. Jamieson to Marketing Specialist... L. M. Jobe to Project Engineer... C. H. Jordan 3d to Manager, F-16 International Flight E/E... D. W. Lynch to Engineering Presentations Specialist... G. A. McCulla, D. A. Elliff and D. F. Sample to Field Service Engineer... L. D. McDade to Scheduler... J. E. Meehan to Project Coordinator... S. C. Mercer, E. L. Hines, S. R. Riddle and R. J. Wenham to Group Engineer... D. L. Miller to Marketing Specialist... R. W. Newhouse to Project Manager... G. E. Nolet to Industrial Engineering Supervisor... R. D. Penney to Material Project Administrator, Senior... W. M. Pichon to Technical Publications Representative... P. B. Porter to Material Planning Supervisor... J. M. Reed to Industrial Engineer... C. S. Adkisson to Quality Control Engineer... R. R. Anguiano to Financial Analyst, Senior... H. W. Blackmon to Assistant Project Engineer... J. F. Cochran and D. G. Gidley to Project Manufacturing Technical Engineer... C. R. Crabb to Assistant Project Engineer... T. R. Deaver to Quality Control Field Engineer, Senior... R. M. Dennard to Engineering Specialist... M. J. Eagleston to Chief of Estimating... T. K. Ford to Logistics Control Analyst, Senior... D. W. Grantham to Industrial Engineering Supervisor... R. O. Grizzard to Logistics Control Representative... H. H. Hendricks to Supervisor-Tool Planning... R. D. Honea and I. N. Samuels to Logistics Supervisor... D. D. Slater to Chief of Facility Engineering... S. O. Spear to Aerosystems Engineer, Senior... D. L. Young to Principal Field Service Engineer... T. R. Robinson to Quality Assurance Engineering Specialist.

Convair: V. C. Holt Jr. was promoted to Material Operations General Supervisor... J. L. Falk to Numerical Control Engineer-Senior... R. Gabor to Operations Supervisor-Production Engineering... M. L. Peng to Accounting Analyst Senior... R. C. Good to Engineering Chief... R. E. Johnston to Manager-Estimating.

Pomona: S. F. Breckner and T. C. Ownesby were promoted to Project Administrator... J. A. Butcher and J. A. Brown to Manufacturing Supervisor... G. C. Cookson to Quality Assurance Specialist... E. F. Mendez to Systems Analyst... R. D. Miner, R. F. Ulloa and L. G. Davies to Project Coordinator... C. E. Olsen to Chief, Professional Staffing... J. T. Porterfield Jr. to Project Representative... D. A. Pugliese, R. J. Renda and A. S. Marino to Group Engineer... P. A. Tatro to Procurement Administrator... W. T. Urban to Engineering Group Supervisor... J. H. Wolfington Jr. to Material Liaison Representative... W. H. Barnhart to Senior Electronics Engineer... J. M. Carrillo to Manager, Facility Planning... L. A. Clark to Administrative Services Supervisor... A. L. Cook and R. R. Nealhow to Laboratory Group Engineer... F. F. Delgado to Employment Supervisor... J. Donaldson to Manager, Facilities Funding... J. M. Hughes 2d to Purchasing Agent... W. Klemm to Manager, Production Engineering... D. M. Maximovich to Chief, Labor Relations... T. F. McAleer 3d to Management Systems Specialist... B. J. McDonnell to Chief Estimating... G. A. Nesbitt and D. M. Scott to Industrial Engineer... D. G. Richards to Superintendent... J. W. Gebhardt to Material Control Manager... B. J. Hook to P. C. Project Coordinator... F. S. Hanna to Product Line Manager.

Datagraphix: R. Burgstiner was promoted to District Service Manager... M. R. Oveross to Engineering Administration Manager... D. E. Ryer to Quality Assurance Engineer, Senior... J. W. Campbell to Senior Marketing Analyst... K. S. Ernest to Project Engineer... R. E. Hickok Jr. to Purchasing Agent... W. A. Nichols to Sales Manager-Printer Products.

Stromberg-Carlson: D. W. Heeschen was promoted to Budget Analyst... R. J. Burkley to Supervisor, Material and Production Coordination... M. P. Galvin to Administrator, Pricing, System Century... A. M. Beaudoin to Administrator, Operations Program... R. E. Scranton to Systems Analyst.

EB Hosts Meeting On Management

Development Systems for Management Professionals was the theme of the first corporate-wide symposium on Management Training and Development hosted in November by Electric Boat.

The two-day symposium brought together representatives from most of General Dynamics' operating units to share ideas and knowledge on management and training functions.

The symposium included six workshops presented by representatives from

the different operating units.

Stromberg-Carlson presented a workshop on team building, and there was a general workshop on quality circles, a form of group problem-solving at Pomona, Fort Worth and EB's Quonset Point, R.I., facility.

Other participants in the symposium were from Convair, Electronics, American Telecommunications, Asbestos Corporation, Data Systems Services and the corporate office.